SAMSUNG | Rockwell Automation

NX700/NX70 Remote I/O System

User Manual

Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. Because of these differences, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Samsung Automation be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Samsung Automation cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual we use notes to make you aware of safety considerations.

WARNING	Identifies information about practices or circumstances which may lead to serious personal injury or death, property damage, or economic loss.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.
ATTENTION	Identifies information about practices or circumstances that can lead to minor personal injury, property damage, economic loss, or product malfunction. However, depending on circumstances, failure to follow the directions accompanying this symbol may also lead to serious consequences.

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1

Features and System Configurations

Types of Remote I/O System Unit

Master Unit

NX700 Remote I/O Master
(NX-MASTER)

Slave Unit

for NX700 PLC
NX700 Remote I/O Master
(NX-MASTER)

for NX70 PLC
NX70 Remote I/O Slave
(NX70-SLAVE)

Features of Remote I/O System

It is possible to send and receive I/O information to remote location control system by two-wire cable, and possible to handle distributed I/O device efficiently. Also, it is possible to install maximum 3 MASTER stations per a PLC, and possible to connect SLAVE stations up to 32 with a MASTER station.

I/O Remote control with NX700plus PLC

I/O information can be exchanged between a Master station and Slave station (included Slave link station) with two-wire cable.

High speed, long distance communication of I/O information

The system can support for a total communication distance of up to 200m per port at a communication rate of 500 Kbps.

I/O control up to 1024 points per Master station

A CPU Unit can control up to maximum 3 Master Units.

The Master Unit can accommodate up to 32 slave stations, or 1,024 points I/O.

Also, each Master Unit has two ports which can handle 2 communication paths, allowing a maximum of 4 communication paths to be created.

Various type of Slave Units and I/O Units can be used.

On the slave station, you can install I/O Units for the NX70, NX700 PLC by using the NX70, NX700 Slave Unit.

You can also use Slave link Units (8points type and 16points type and 32 points type) to increase the number of I/O points as necessary for each slave station.

Maintain functions to errors such as a disconnection of communication cable or encountering a problem

Control advanced Units on a Slave station (except Link)

In PLC system that is installed with Slave station, possible to use advanced Units (SCU, HSC, A/D.....etc.) including general I/O Unit. (except Multi Wire-Link, Master Unit)

Specifications of Remote I/O System

General Specification

Item		Specification
Ambient Temperature	Operating Temperature	0 to 55 °C
	Storage Temperature	-25 to 70 °C
Ambient Humidity	Operating Temperature	5 to 95% RH (Non-condensing)
	Storage Temperature	5 to 95% RH (Non-condensing)
Vibration Resistance		10 to 55Hz/1 min., amplitude 0.75mm, each direction of X, Y, Z for 10 min.
Shock Resistance		Occasional excursions to 15g/11ms, half-sine in each of three mutually perpendicular axes
Noise Resistance		Noise Voltage 1500Vp-p, Noise Pulse 50nS, 1 μs (Noise simulator)
Operating condition		No corrosive gas or severe dust conditions are allowed

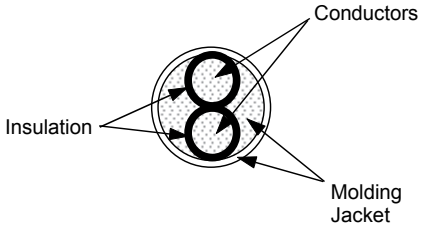
Performance Specifications

Item			Specification
Communication Method			Two-wire, Half Duplex
Synchronous Method			Asynchronous System (Start to Stop Method)
Communication Distance per port (1)			200 m
Communication Speed			0.5 Mbps
Communication Path			2 conduct cable (VCTF Cable) Twisted-Pair Cable (2)
Interface			RS-485
Transmission Error Check			CRC (Cyclic Redundancy Check)
I/O control	Controllable Master Unit per CPU		Max. 3 Units
	Interfacing Slave Unit per Master Unit		Max.32 Stations (Units)
	Control I/O Point	Per CPU Unit	Max. 1,024 points
		Per Master Unit	Max. 1,024 points
	Control Slot No.	Per CPU Unit	Max. 64 slots
		Per Master Unit	Max. 64 slots
		Per Slave Unit	Max. 25 slots (for NX700), Max. 8 slots (for NX70)
Unit that cannot be installed on Slave Unit System			Master Unit, Optical Unit, MW-Link Unit

NOTE (1) Transmission distance is changed according to usage cable and Unit type
(2) Cable specifications

VCTF (Vinyl Cabtyre Cable): 2-conductor

- **Conductor**
  a. Size: Min. 0.75 mm2 (AWG 18 or larger)
  b. Resistance: Max. 25.1Ω/km (at 2 °C/ 68°F)
- **Cable**
  a. Insulation thickness: Min. 0.6mm (0.24in.)
  b. Molding jacket diameter: 6.6mm (2.6in.)



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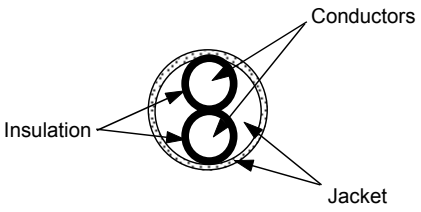
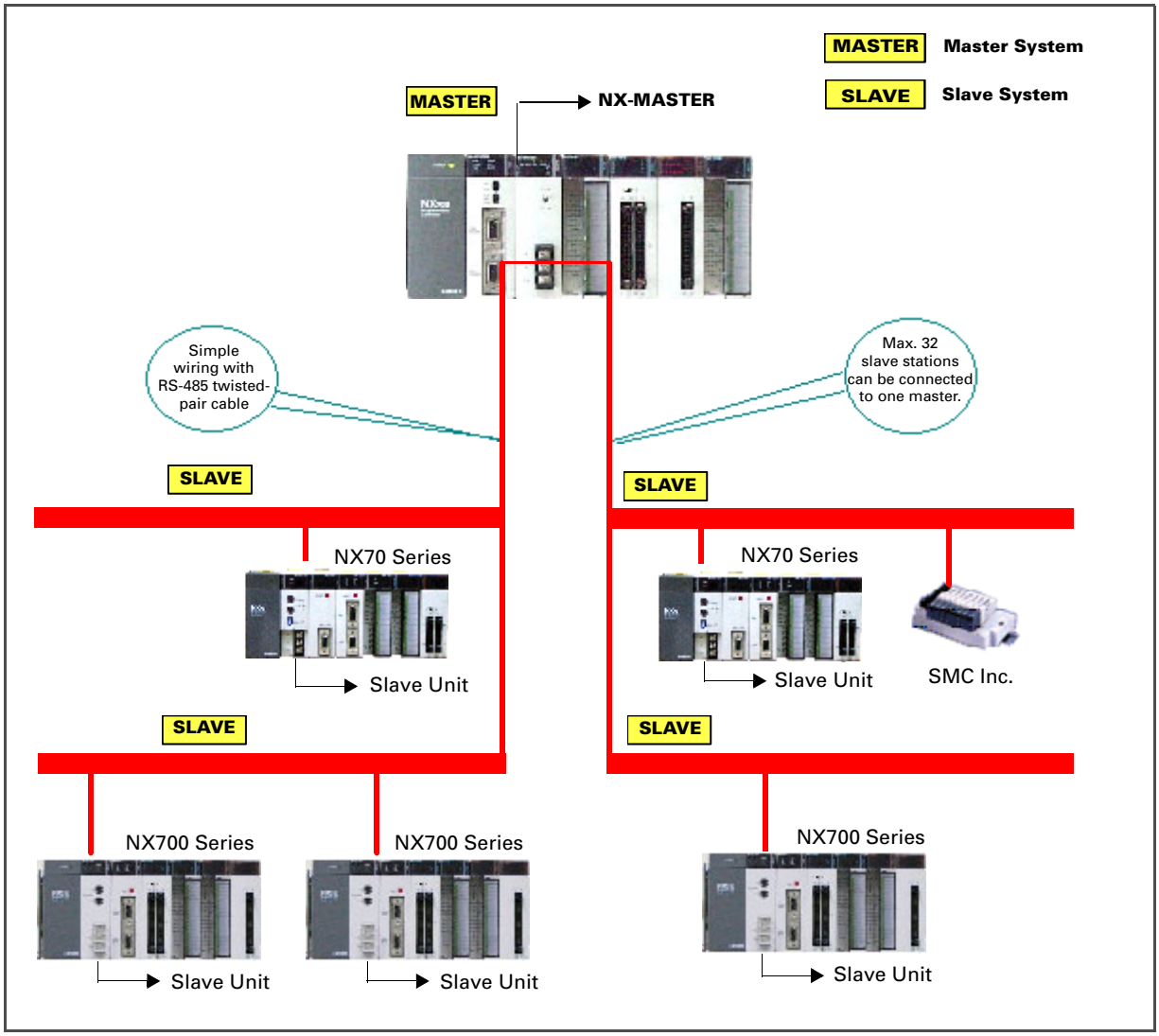


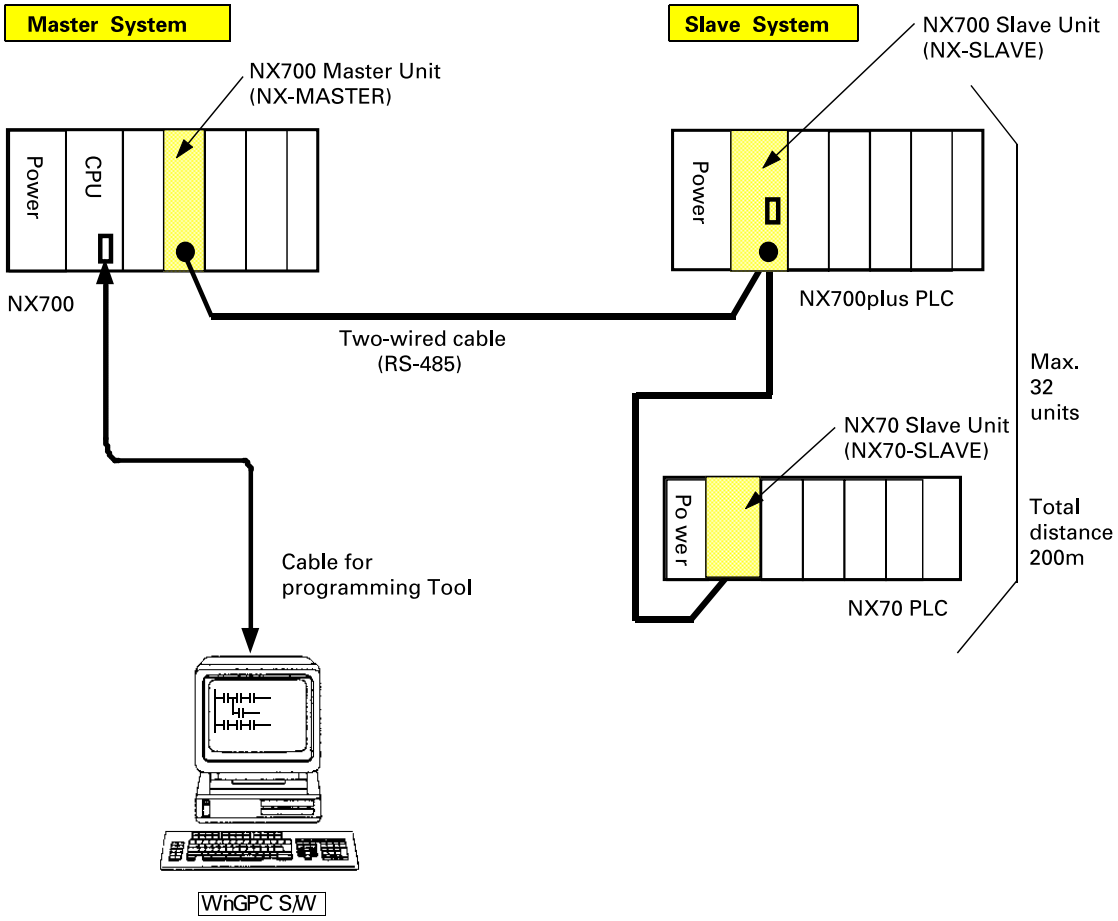
Remote I/O System Configuration

Configurations



Basic System Configuration

- REMOTE I/O System is a RS-485 mode (multi-drop) network that is made up with Master System (CPU Unit + Master Unit), Slave System (Slave Unit + I/O Unit etc.), and transmission cable (two-wire cable) that is interfaced to each stations. CPU Unit of **Master System** control I/O of **Slave System** through Master Unit.
- Master System is possible to interface by mixing various Slave Units, such as Slave Unit of NX700 and NX70 PLC.



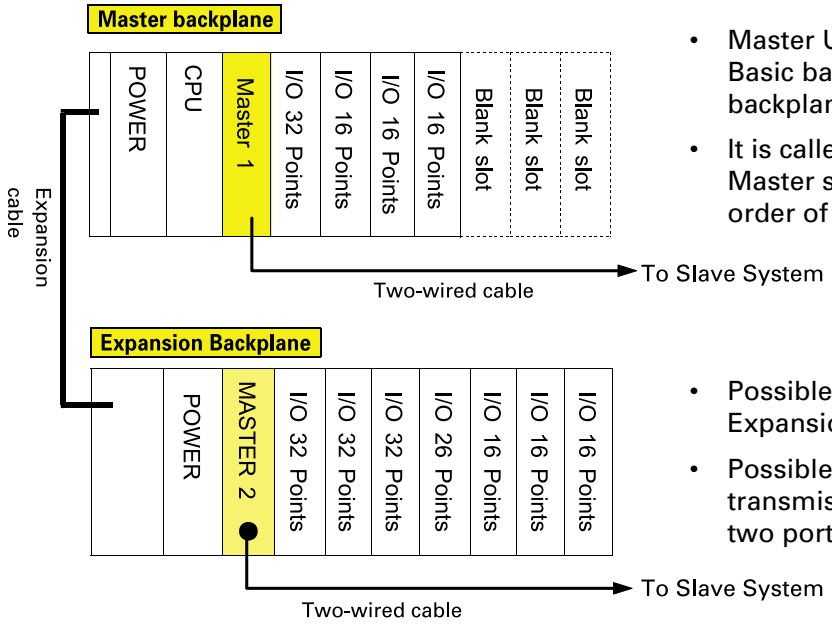
Master Station

Performance Specification

Product Type	Installation Method	Current Consumption	Product No.
for NX700 PLC REMOTE I/O Master Unit	Possible to use by installing at basic and Expansion backplane NX700: up to 3	450mA (at 5V DC)	NX-MASTER

Basic Configuration

- The function of Master station is that transmits I/O information of CPU Unit to Slave stations.
- Configures Master System of REMOTE I/O System with CPU Unit. Possible to install up to 3 Master station per a CPU Unit. Possible to Install to Master backplane or Expansion backplane.

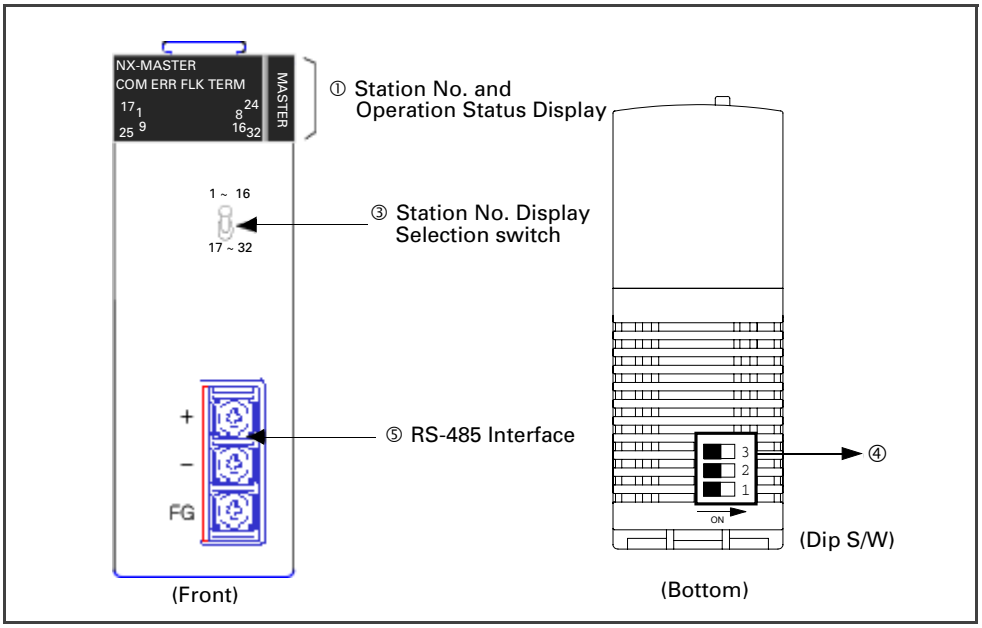


- Master Unit is installed to I/O slot of Basic backplane or Expansion backplane.
- It is called as a Master station1, Master station2, Master station3 in order of installing location.

- Possible to install Master Unit on the Expansion backplane.
- Possible to configure two way transmission lines because there are two ports per a Master Unit

Part Names and Functions

NX700 PLC Master Unit (NX-MASTER)

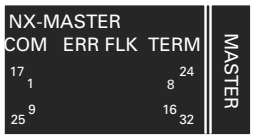


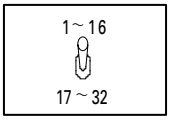
The functions in each part

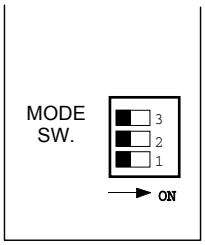
Station Number LEDs

Indicates the slave station number (01 to 32) of the slave station which is connected to the Master Unit.

External Diagram and Functions (NX700 PLC Master Unit)

<table>
<tr>
<td>① Station No. Display and Operation Status Display
 

Light on
Fast flickering (0.2sec interval)
Slow flickering (1.0sec interval)
Light off</td>
<td>• LEDs of Slave Units No. 1 to 32 which are connected to Master Unit.
• Checking for lights by changing display range either 1 to 16 or 17 to 32 with display selection switch.
“COM”, “ERR” LED: Communication and operation status.
<table>
<tr><th>LED</th><th>Display</th></tr>
<tr><td>COMM. (Communication Status)</td><td>(On): Stand-by
(Fast flickering): Transmitting in normal operation
(Slow flickering): Transmitting in stop mode
(Off): Transmission error</td></tr>
<tr><td>ALARM (Error)</td><td>(On): Unit malfunction
(Fast flickering): Slave Station No. Configuration error
: Restricted Unit mounting error
(Off): Normal</td></tr>
<tr><td></td><td>(On): Using Remote I/O</td></tr>
<tr><td></td><td>(On): End Station (Off): Not an end station.</td></tr>
</table>
</td>
</tr>
<tr>
<td>③ Station (Slave) No. Display Selection switch</td>
<td>Dip Switch
 

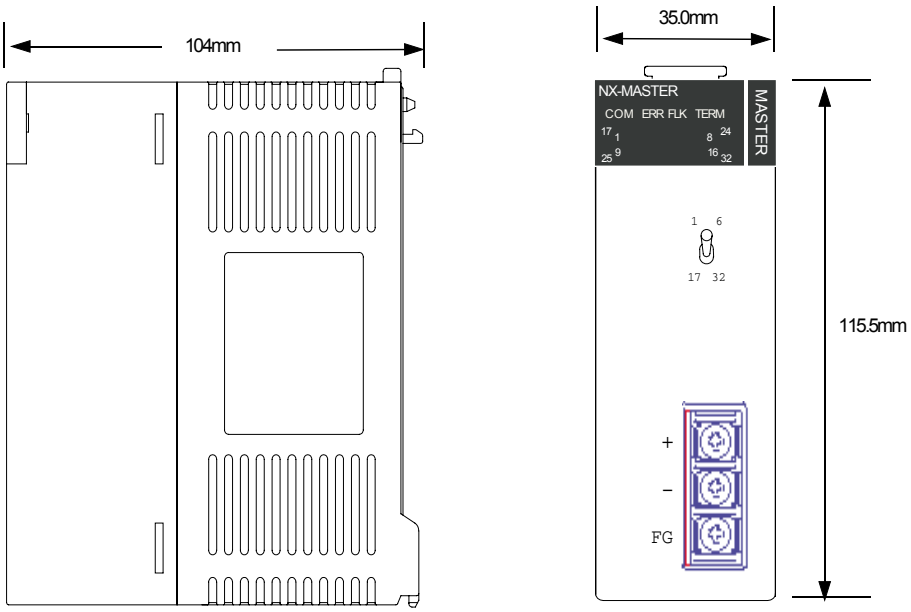
Station (Slave) No. Set display range to either 1 to 16 or 17 to 32 with this switch.</td>
</tr>
<tr>
<td>④ Operation mode setting switch
 

Factory default setting is all OFF.</td>
<td>Select mode setting when choosing transmission path, setting end station, or communication error.
<table>
<tr><th>SW.</th><th>Operation</th><th>OFF</th><th>ON</th></tr>
<tr><td>3</td><td>Communication error mode</td><td>Operation stop mode</td><td>Operation continue mode</td></tr>
<tr><td>1, 2</td><td>Select end station</td><td>Not an end terminal</td><td>An end station.</td></tr>
</table>
ATTENTION

• Settings of SW1 and SW2 must be the same.
• Factory default setting is all OFF.
• Settings are recognized only when power turns on.</td>
</tr>
<tr>
<td>⑤ RS-485 Interface</td>
<td>Connection terminal for network transmission cable. 1 port on the terminal.</td>
</tr>
</table>

Master Unit Dimensions

NX700 Remote I/O Master Unit (NX-MASTER)



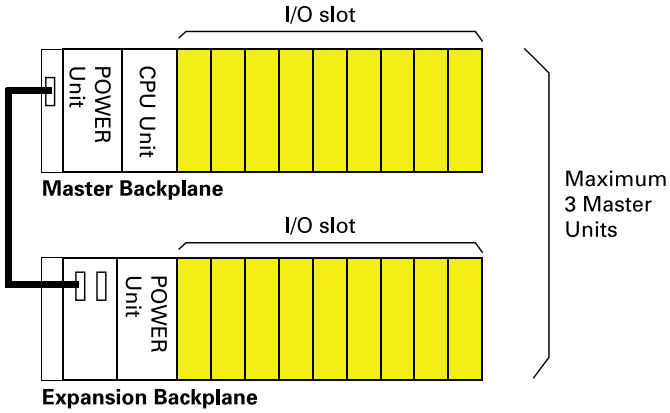
Installing a Master Station

A Master station can be configured with a Master Unit installed on the Master backplane (With a CPU Unit and Power Unit) or an Expansion backplane (with a Power Unit) One CPU can control a maximum of 3 Master Units.

Location of Master Station

The Master Unit can be installed in any I/O slot on a Master backplane or Expansion backplane

- NX700 Master Unit (NX-MASTER)

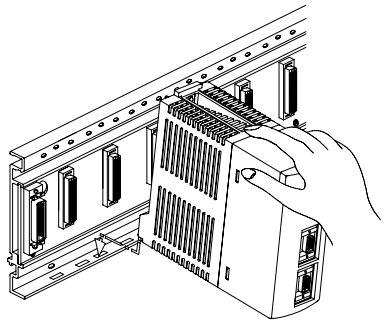


Installation of Master Station

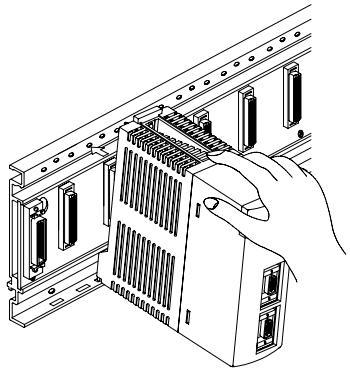
- Be sure to remove or install the Master Unit only when all power is OFF.
- A maximum of 3 Master Units can be installed on PLC System.
- Do not touch its connectors on rear side of the Unit or Backplane with your hand. Static electricity build-up on your body can damage.

NX700 PLC Remote I/O Master Unit (NX-MASTER)

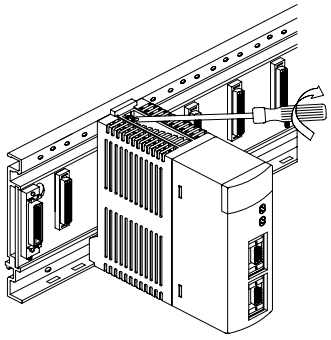
1. Fit the Unit tabs in to the Unit holes on the backplane.



2. Push the Unit in the direction of the arrow and mount on to the backplane.



3. After properly mounting the Unit to the backplane, secure the mounting screws at the top.



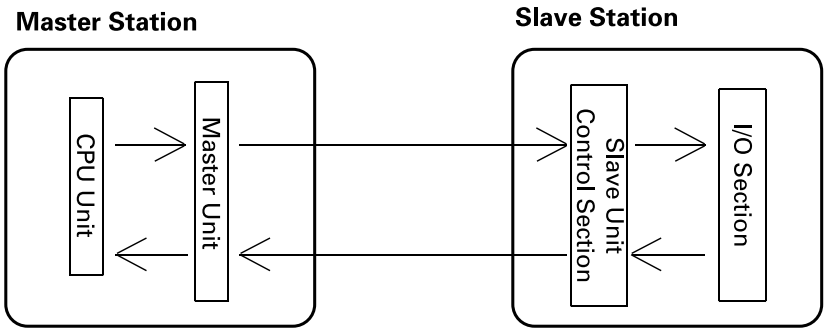
Slave Station

Performance Specification

Product Type	Installation Method	Communication Port	Current Consumption	Product No.
NX700 REMOTE I/O Slave Unit	Use by installing at CPU Unit location of Master backplane	RS-232/422 1 Port It was not operated on NX700plus CPU Unit	400mA	NX-SLAVE
NX70 REMOTE I/O Slave Unit		None	200mA	NX70-SLAVE

Description

I/O that is controlled from REMOTE I/O System to Master System (CPU Unit + Master Unit) is called as Slave System. Possible to interface up to maximum 32 Units per a Master Unit, and control maximum 1,024 points I/O.



- Slave Unit is possible to mix. Slave Unit of NX700, NX70 System Slave link Unit are possible to use as Slave System.
- Set station No. to each Slave System. I/O Number is allocated in order of station No.
  Not necessary to set station No. in order of Master System. Also, no matter even though there are no station No.

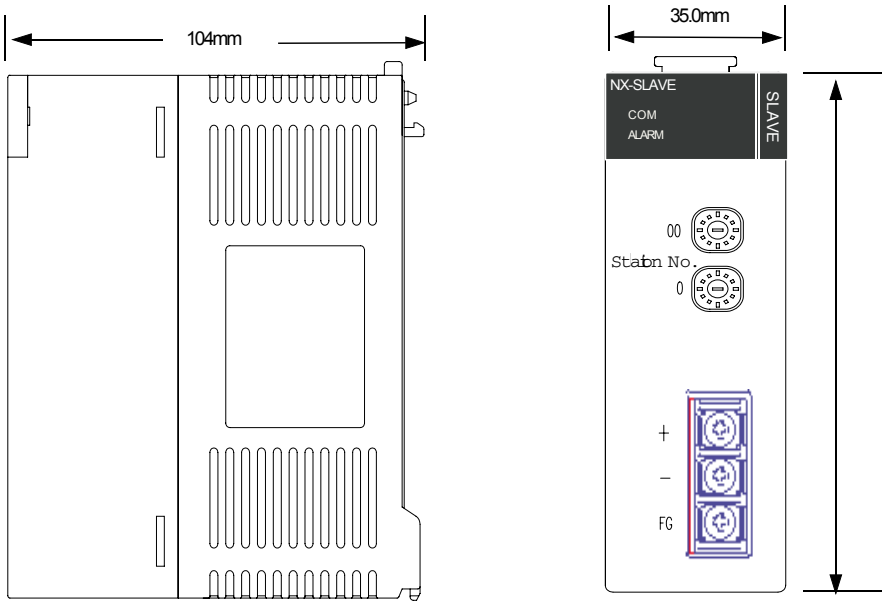
Types of Slave Station

Slave Unit (for NX700, NX70 PLC)
Install Slave Unit instead of CPU Unit at the CPU slot location of Master backplane. (see the previous page picture). The system is installed with Slave Unit as Slave Unit Section that is shown previous page. Also, Slave System can control advanced Unit (SCU, Positioning Unit, HSC, A/D,.....) including I/O Unit.

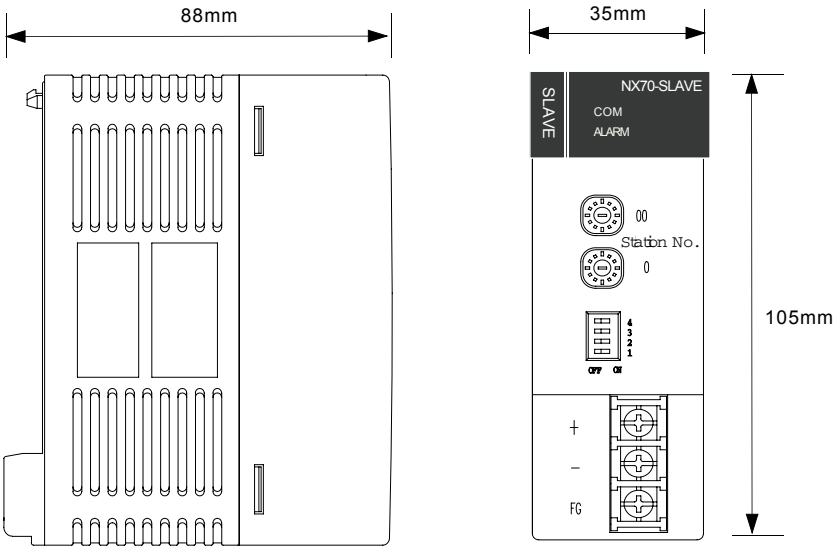
Slave Unit Correspondence Device
Devices that are used as Slave Unit by interfacing to company concerned Master Unit with products of the third party. Possible to interface with Solenoid Valve (Manifold Electronic edge) that is on sale in SMC Company, CKD Company in Japan. (see their manual for more detail)

Slave Unit Dimensions

NX700 Remote I/O Slave Unit (NX-SLAVE)

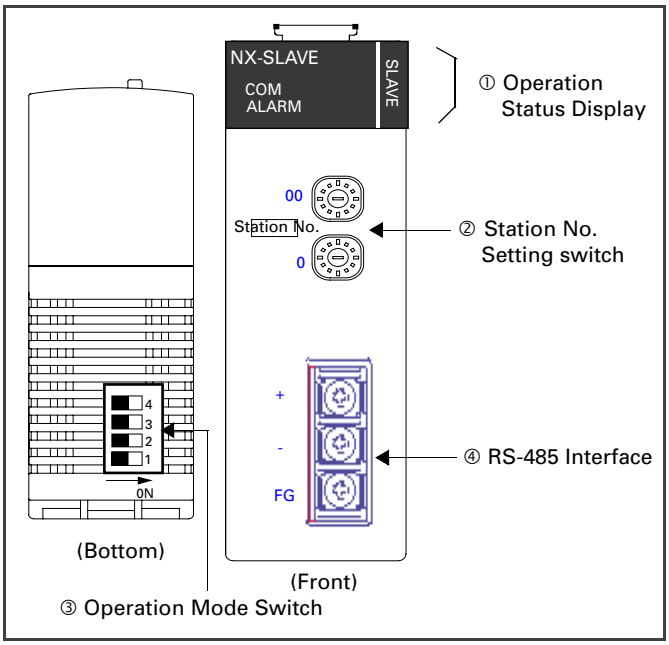


NX70 Remote I/O Slave Unit (NX70-SLAVE)

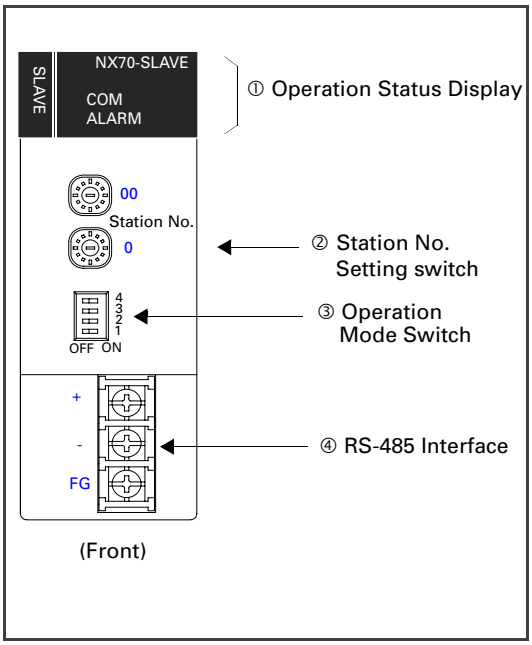


Part Names and Functions

NX700 Remote I/O Slave Unit (NX-SLAVE)

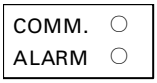


NX70 Remote I/O Slave Unit (NX70-SLAVE)



External Diagram and Functions (Slave Unit)

① Operation Status Display



Light on

Fast flickering (0.2sec interval)

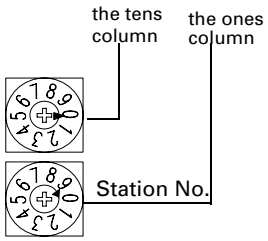
Slow flickering (1.0sec interval)

Light off

Communication and operation status.

LED	Display
COMM. (Communication Status)	(On): Stand-by (Fast flickering): Transmitting in normal operation (Slow flickering): Transmitting in stop mode (Off): Transmission error
ALARM (Error)	(On): Unit malfunction (Fast flickering): Slave Station No. Configuration error : Restricted Unit mounting error (Off): Normal

② Station No. Setting switch (Rotary switch)

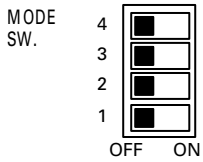


Setting station No. for Remote I/O System. (Turn the dial and align the arrow () with the number you want. In addition, the numbers in tens and ones columns should be set separately.)

ATTENTION

- When No. outside the range is set, setting error (ALARM LED flickering) occurs and transmission fails.
- Refer to Step ③ of Remote I/O connection.
- Settings are recognized on power input.

③ Operation Mode Setting Switch



Factory default setting is all OFF.

End station setting, mode setting for communication error

SW.	Operation	OFF	ON
4 *	RS422/RS232C Selection Switch	RS422	RS232C
3	Output on communication error	Output OFF	Output ON
1, 2*	End station setting	Not an end terminal.	An end station.

ATTENTION

- Settings of SW1 and SW2 must be the same.
- Settings are recognized only when power turns on.
- SW4 is communication connector for programming tools. (Only for NX700) (But SW4 is not used on NX700, NX70, Slave Units.)

④ RS-485 Interface

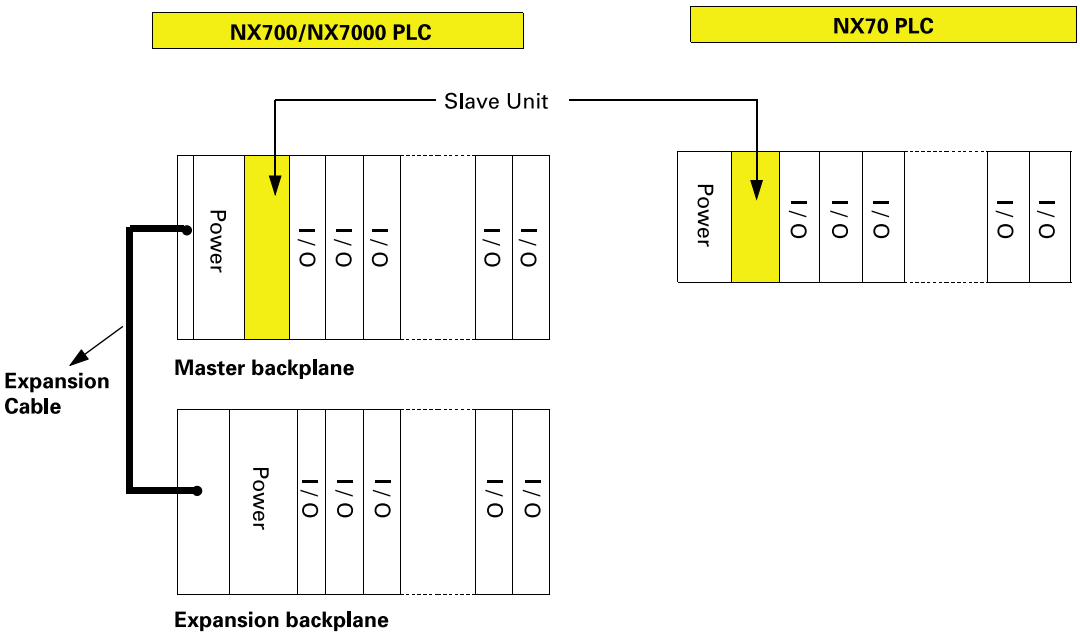
Connection terminal for network transmission cable.

Installing remote I/O Slave Unit

There are NX700 PLC Type (NX-SLAVE), and NX70 PLC Type (NX70-SLAVE) in REMOTE I/O Slave Unit. REMOTE I/O Slave Unit is installed at CPU Unit location of PLC System, and it is controlled as a Slave Unit of Master System

Installation Condition

- REMOTE I/O Slave Unit have to be installed at CPU Unit location of Master backplane Unit.
- Install I/O Unit or Advanced Unit. (but, MW-Link Unit and Interrupt Unit cannot be installed)
- Configuration condition (Limitation of current consumption, etc.) is common. Use expansion cable (1.2m or 3m) in case of expansion.



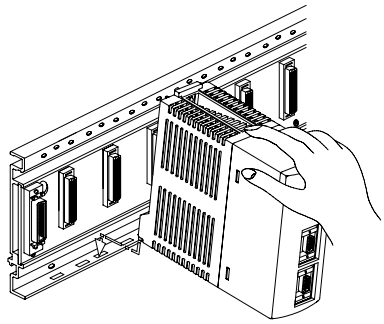
NOTE Install CPU SLOT of [yellow] part.
Install I/O Unit or advanced Unit to each I/O Slot.

Installation Method

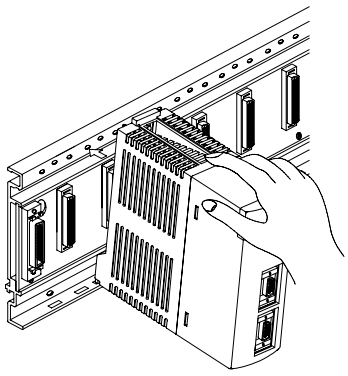
- Install and remove when power is OFF
- Possible to use by installing up to total 3.
- Don't touch connector terminal part. it causes faulty contact or faulty operation by static electricity.

NX700 PLC Remote I/O Master Unit (NX-SLAVE)

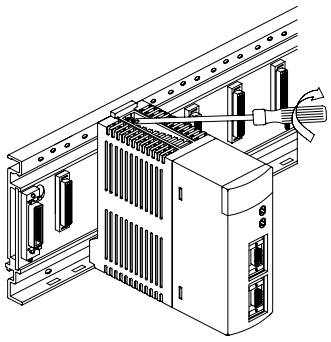
1. Attach projecting part (2 parts) of Unit to the Unit fixing hole of Master backplane.



2. Install Unit at the Master backplane by pressing in the direction of arrow.



3. Fix it with screw after installing at the Master backplane.



4

Transmission Time

Transmission Time

Indicates transmission time that is required to control Remote I/O System.

Remote I/O Scan Time (TR)

REMOTE I/O Scan Time is a time to set every input DATA that is received from each Slave Unit to buffer which is inside of Unit, since every output DATA that is set buffer in the Unit is sent to each Slave Unit which is interfaced with Master Unit.

TR = 0.8 + (0.85x n) + (0.55 x N) + (0.13 x W) (ms)

n = Slave link No.

N= Slave Unit No.

W= Remote I/O usage I/O Word No.

EXAMPLE

In case of interfacing,

10 Slave Unit (Input 16 points, Output 16 points),

1 Slave Unit (4 Input 32 points Unit, 4 Output 32 points Unit)

$$TR = 0.8 + (0.85x\ 10) + (0.55 \times 1) + 0.13 \times \left(\frac{(32 \times 10) + (32 \times 4) + (32 \times 4)}{16}\right)$$

$$= 14.53 \text{ ms}$$

Remote I/O Memory Access Time (TRM)

Remote I/O Memory Access Time is a time to receive MEMORY ACCESS COMPLETION MESSAGE from Slave Unit since Master Unit takes MEMORY ACCESS REQUEST from CPU Unit.

TRM = TR x 2 + (0.7 + 0.17 x WRM) (ms)

TR = Remote I/O Scan Time

WRM = Memory Access Word No.

EXAMPLE

In case of interfacing,

10 Slave Unit (Input 16 points, Output 16 points),

1 Slave Unit (4 Input 32 points Unit, 4 Output 32 points Unit)

$$TRM = \left[0.8 + (0.85x\ 5) + (0.55 \times 1) + 0.13 \times \left(\frac{(32 \times 5) + (32 \times 2) + (32 \times 2) + 32}{16}\right)\right]$$

$$\times 2 + (0.7 + 0.17 \times 32)$$

$$= 22.54 \text{ ms}$$

Remote I/O Delay Time (T_{RES})

REMOTE I/O Delay Time is a time to output signal based on the result of operation computing since input signal that is inputted to Slave Unit is carried to CPU Unit with Master Unit.

$$T_{RES} = T_{IRES} + T_C + T_{ORES}$$

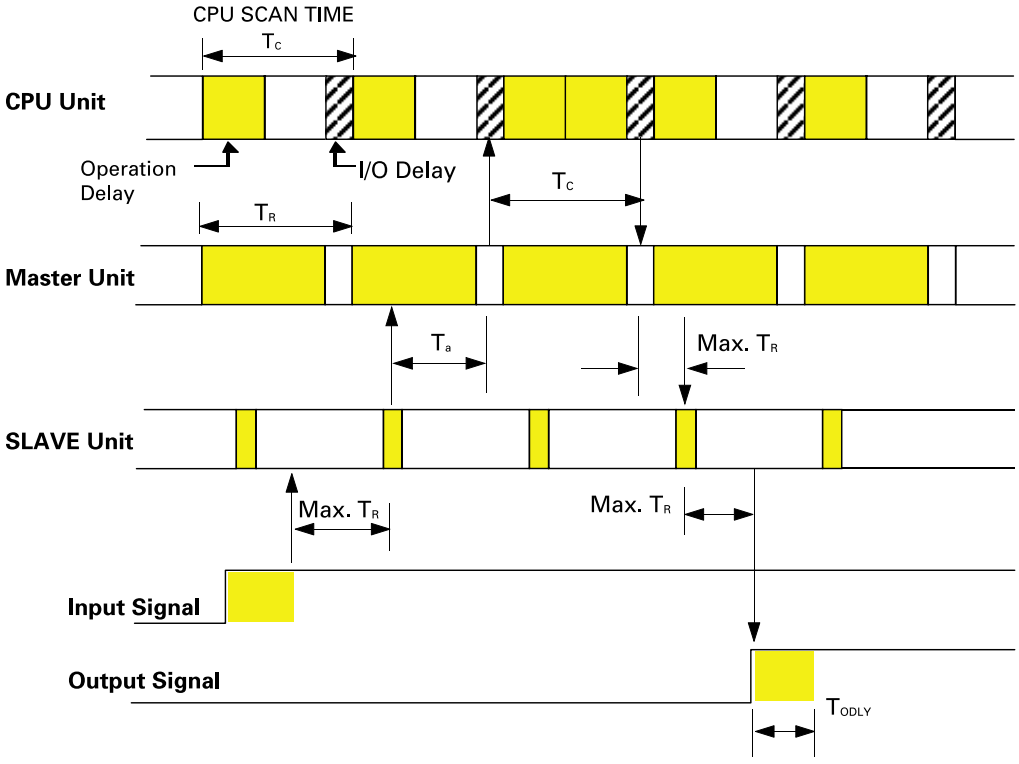
T_{RES} : REMOTE I/O Delay Time
T_{IRES} : REMOTE I/O Input Delay Time
T_{ORES} : REMOTE I/O Output Delay Time
T_C: CPU Unit SCAN TIME

Maximum value of REMOTE I/O Delay time is shown below.

$$T_{RES.MAX} = T_{IRES.MAX} + T_C + T_{ORES.MAX}$$
$$T_{IRES.MAX} = T_{IDLY} + TR + T_a$$
$$T_{ORES.MAX} = TR \times 2 + T_{ODLY}$$

T_{IDLY} : Input delay time
T_R : Scan time of the remote I/O System
T_A : When synchronous mode
- When $T_C < T_R$, $T_a = T_R$
- When $T_C > T_R$, $T_a = T_C$

When synchronous mode
- When $T_C < T_R$, $T_a = T_C + T_R$
- When $T_C > T_R$, $T_a = T_C$



5

Interface of Remote I/O System

System Register Summary About Remote I/O System Control

REMOTE I/O Map Setting and Base Word Setting are needed to operate REMOTE I/O. The flags for operation are shown below.

Master 1 (Loop 1): F8 REGISTER

Master 2 (Loop 2): F9 REGISTER

Master 3 (Loop 3): F10 REGISTER

Flag	Explanation	Initial Value	Set Value and Contents	I/O
F8.0	Yes/No of Master Unit installation	1	1: Unit is installed	Output
F8.1	Request REMOTE MAP resetting using real slot information (1)	0	1: Request setting (Real value)	Input
F8.2	Starting operation after checking Slave Unit that is set (1)	0	1: Operation after checking Slave Unit	Input
F8.3	Request REMOTE MAP resetting using user configured slot information (1)	0	1: Request setting (user configured slot info.)	Input
F8.4	Request real slot information READ (1)	0	1: Check interface.	Input
F8.5	Display REMOTE Base Word setting		1: Already configured	Output
F8.6	Ignore in case of REMOTE Error	0	1: Ignore ERROR	input
F8.7	Request REMOTE Master RESET	0	1: Request RESET	input
F8.8	Indicate error in case of initializing REMOTE	0	1: Initializing ERROR	Output
F8.9	Indicate AC Fail error in Slave Unit	0	1: AC Fail	Output
F8.10	Indicate I/O Unit change in Slave Unit	0	1: Unit change	Output
F8.11	Indicate error in Slave Unit	0	1: Slave Unit ERROR	Output
F8.12	Indicate error on communication	0	1: Communication ERROR	Output
F8.13	Not used			
F8.14	Indicate executing RMRD,RMWR order	0	0: Complete execution	Output
F8.15	Indicate Failure of RMRD,RMWR order	0	0: Normal completion	Output
F12.1	Indicate REMOTE MAP configured or not	0	1: Configured	Output

NOTE The flags (1) correspond to F8 register, and are applied to every Master Unit

Information about base word are stored in SR11 to SR16, and it is changed through WINGPC S/W.

Register	Contents	Initial Value
SR11	Base word of REMOTE Master Unit 1 (Loop 1)	64
SR12	Base word of REMOTE Master Unit 2 (Loop 2)	96
SR13	Base word of REMOTE Master Unit 3 (Loop 3)	112
SR14	COMPLEMENT Value of Base word of REMOTE Master Unit 1 (Loop 1)	-
SR15	COMPLEMENT Value of Base word of REMOTE Master Unit 2 (Loop 2)	-
SR16	COMPLEMENT Value of Base word of REMOTE Master Unit 3 (Loop 3)	-

Communication Error Code with Interfaced Slave Unit

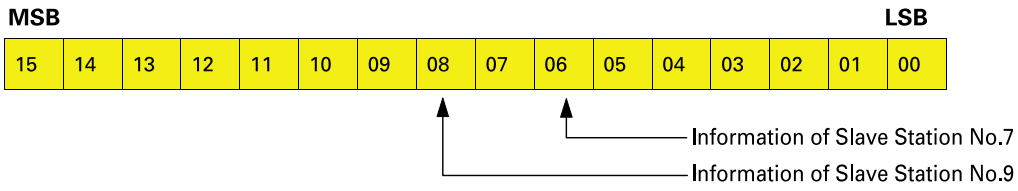
Register	Contents	Remarks
SR261	Master Unit 1 transmission line ERROR	ERROR Code See *"Error Code of Remote I/O" in Chapter 10*
SR262	Master Unit 2 transmission line ERROR	
SR263	Master Unit 3 transmission line ERROR	

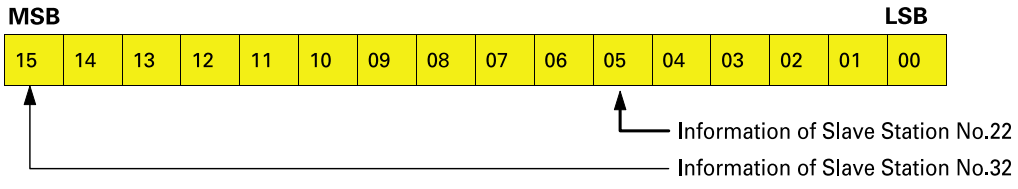
AC Fail or Error Operation Slave Unit Information Display Register among Interfaced Slave Unit (1)

Register	Contents	Remarks
SR274, 275	SR274='0002H' indicates that error occurs on Slave Station No.2 among Slave Units that are connected to Master Station No.1.	Display Slave Unit that error occurs among Slave Units that are connected to Master Unit
SR276, 277	SR276='0003H' indicates that error occurs on Slave Station No.1 and 2 among Slave Units that are connected to Master Station No.2.	
SR278, 279	SR279='0004H' indicates that error occurs on Slave Station No.19 among Slave Units that are connected to Master Station No.3.	

Interfaced Slave Unit Information Register (1)

Register	Contents	Remarks
SR264, 265	SR265='0003H' indicates that Slave Station No.17, 18 are connected to Master Station No.1.	Display Slave Unit that is interfaced with each Master Unit.
SR266, 267	SR266='0003H' indicates that Slave Station No.1, 2 are connected to Master Station No.2.	
SR268, 269	SR269='0003H' indicates that Slave Station No.17, 18 are connected to Master Station No. 3.	





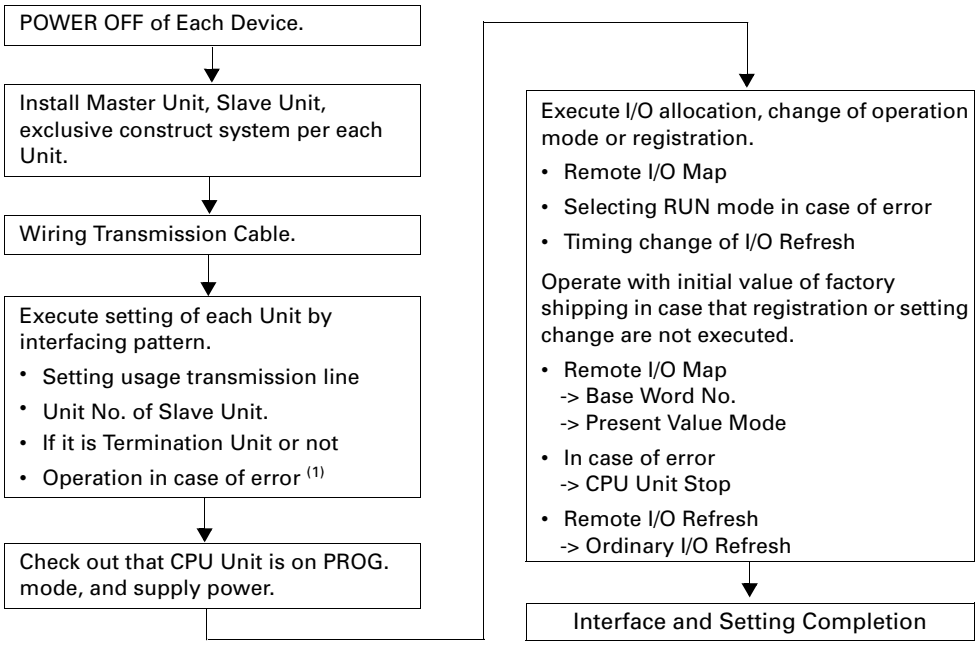
Interfacing Sequence of Remote I/O System

This chapter explains about interfacing and setting method when REMOTE I/O System is constructed. Interface and setting are executed by interfacing pattern or operation content. Precautions are shown below.

- Interfacing pattern (See next page), Station No. of Slave Unit.
- Remote I/O Map (See *"Chapter 6"*)
- Handling in case of error (*See "Remote I/O Control When Error Occurs" in Chapter 7*)
- Timing of Remote I/O Refresh *"Remote I/O Update Timing Method" in Chapter 7*)

Summary of Interface and Setting Sequence

See *"Sequence of Interface and Setting" in Chapter 5* for more detail.


POWER OFF of Each Device.
Install Master Unit, Slave Unit, exclusive construct system per each Unit.
Wiring Transmission Cable.
Execute setting of each Unit by interfacing pattern.
• Setting usage transmission line
• Unit No. of Slave Unit.
• If it is Termination Unit or not
• Operation in case of error (1)
Check out that CPU Unit is on PROG. mode, and supply power.
Execute I/O allocation, change of operation mode or registration.
• Remote I/O Map
• Selecting RUN mode in case of error
• Timing change of I/O Refresh
Operate with initial value of factory shipping in case that registration or setting change are not executed.
• Remote I/O Map
-> Base Word No.
-> Present Value Mode
• In case of error
-> CPU Unit Stop
• Remote I/O Refresh
-> Ordinary I/O Refresh
Interface and Setting Completion

NOTE Operation Mode is set with each Unit and CPU Unit separately.
See *"Remote I/O Control When Error Occurs" in Chapter 7* for more detail about setting, operation condition, and so on.

Interfacing Pattern of Remote I/O System

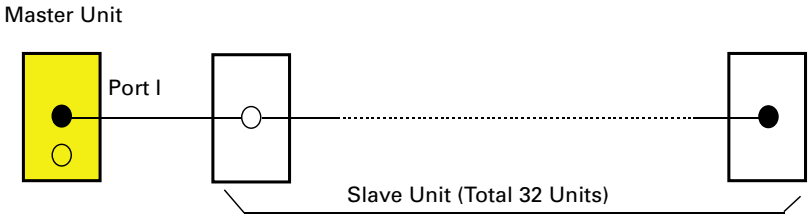
There are 6 interface methods of Master Unit and Slave Unit. 6 types (A to F) of interface method are shown below.

NOTE

- Don't execute other interface except 6 types that are shown below.
- Execute interface of transmission CABLE in order of Master Unit.
- Don't execute multiple wiring.
- See *"Sequence of Interface and Setting" in Chapter 5* for more detail about interface and setting.

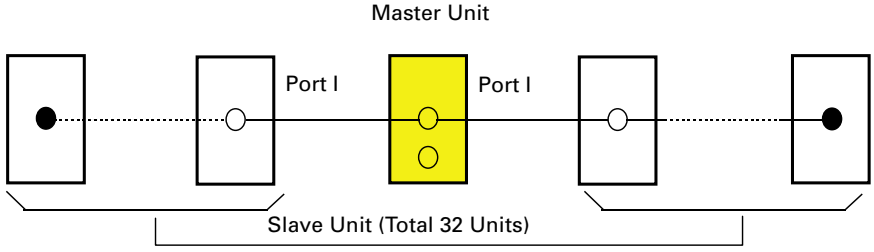
Interfacing Pattern A	1 transmission line (use only port I) ·

Terminal Unit is a Slave Unit of Master Unit (port I) and termination. Impossible to interface by using only port II.



Interfacing Pattern B	1 transmission lines (use only port I) ·

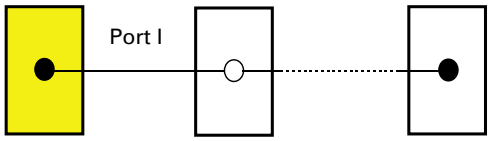
Terminal Unit is a Slave Unit of both terminal of each line. Impossible to use by using only port II.



Interfacing Pattern C	1 transmission line (use only port I, II) 1 Loop

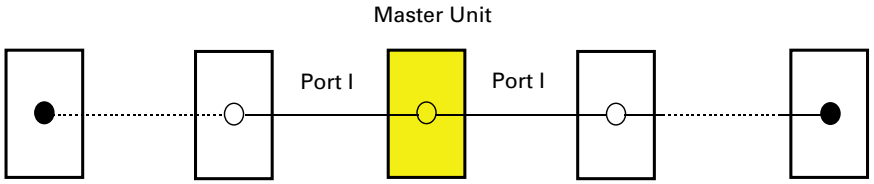
Terminal Unit are Master Unit (PORT I,II common) and Slave Unit (PORT I and PORT II).

Master Unit



Connection Pattern D	2 transmission lines (use port I, II) · 2 Loop

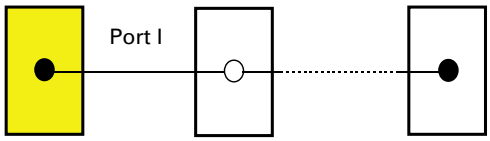
Terminal Unit is a Slave Unit of both terminal of each transmission line.



Connection Pattern E	2 transmission lines (use port I, II) • I is 1 LoopII is 2 Loop

In Terminal Unit, transmission line using port I are Slave Unit of Master Unit and terminal, and transmission line using port II is a Slave Unit of both terminal.

Master Unit



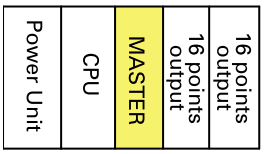
Sequence of Interface and Setting

Explain sequence of interface and setting when REMOTE I/O System is constructed.

Preparation

- POWER OFF of each device.
- Preparation and installation of each device of Master Unit and Slave Unit.

Master System



Install Master Unit

Master Unit: 1
Ordinary I/O: 32points (Master Unit is no point)

Slave System

Slave unit System (1)

(I)

Install Slave Unit to CPU Unit

3 slots
I/O: 64 points

- Install each Unit to designated location. The system that executes Remote I/O control of I/O 128 points, is constructed with a Master Unit by interfacing 3 Slave Units like above picture. Therefore, the CPU Unit executes control of total I/O 176 points (including ordinary I/O area (32 points) and Remote I/O area (128 points).

Step ①

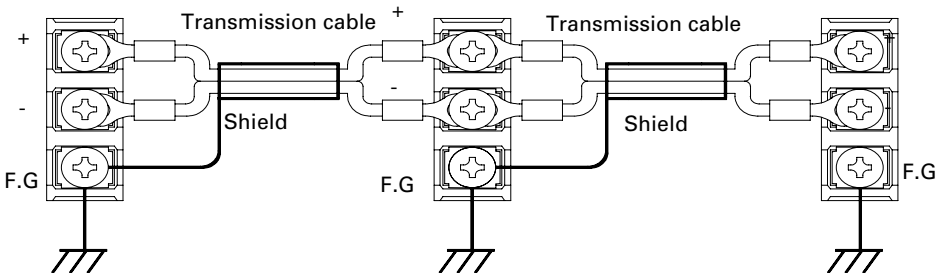
[Wiring of Transmission Cable]

Wiring transmission cable (two-wire cable) between each Unit that is installed.

- Twisted pair cable or UL Style No. 2919 24AWG of LG (korea) equivalents are used as transmission cable.
- The length of transmission cable is less than Max. transmission distance per eachtransmission line (from terminal Unit to terminal Unit).

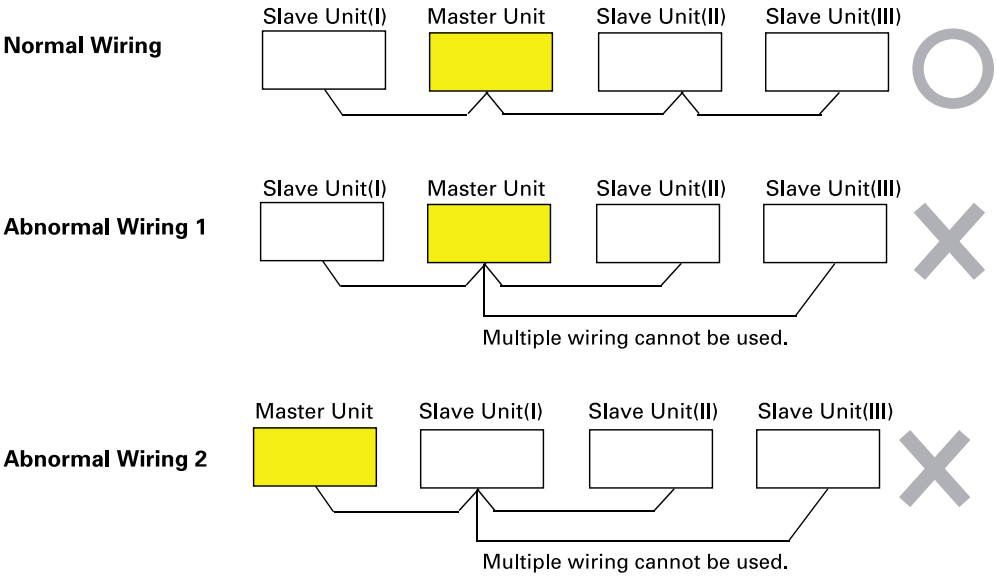
Interfacing Method

- Interface and wiring are executed in order of Master Unit
- Wiring interface through each Unit.
- Interface + side and + side, - side and - side of RS-485 Interface of each Unit (picture is shown below)
- Interface one side of shield wire of transmission cable, and fold (picture is shown below)



[RS-485 Interface] [RS-485 Interface] [RS-485 Interface]

Example of Wiring



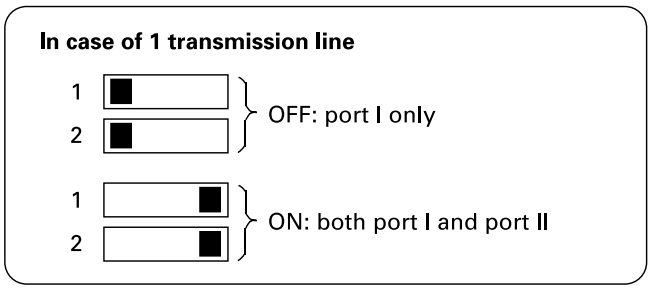
Sequence ②
[Setting of Master Unit]

Set about REMOTE I/O Master Unit

1. Selection of transmission port (transmission line).

Select and set transmission port that will be used.

Set SW1, SW2 of Mode Selector Switch.

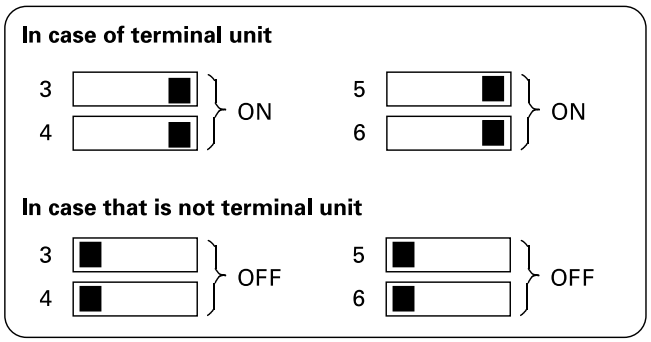


2. Setting of Terminal Unit.

Set Terminal Unit in case of interfacing with 1 transmission line.

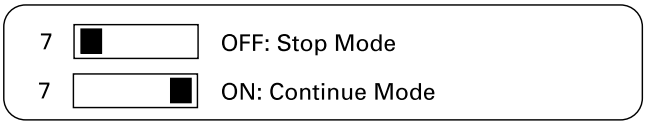
Interfacing Method

Set SW3, SW4 of Mode Selector Switch.



3. Mode Selector Switch In Case of Error on Communication.

When error occurs on communication, choose if Remote I/O System control is stopped or not. Configure SW7 of Mode Selector Switch.



NOTE ERROR LED of CPU Unit is lighting when error occurs on setting of terminal Unit. Supply power again after setting.

Sequence ②
[Setting of Slave Unit]

Set about system that is installed REMOTE I/O Slave Unit.

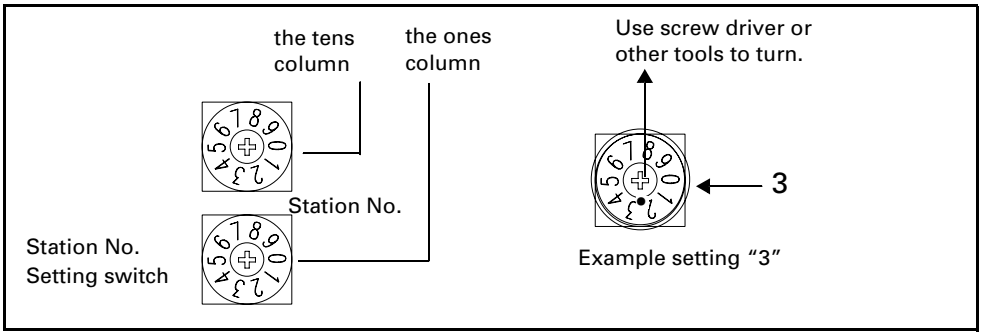
1. Setting of Slave Station No.

Attention in case that Unit No. is set on Slave Unit.

- Possible to interface up to 32 stations per a Master Unit. (Station No. Setting Range: 01 to 32)
- Total I/O point is less than 1,024 points.
- Set station No. that is not overlapped with other Slave station.
- Unit which is interfaced with same Master Unit.
- I/O No. is allocated in order of small station No.

Interfacing Method

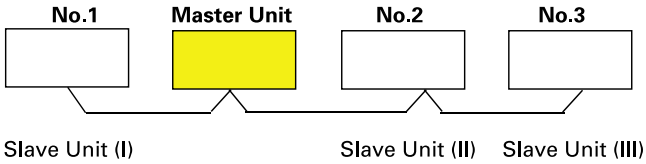
Set station No. by turning Station No. selector switch (rotary switch).



No matter even though there is no station No.
Don't need to set station No. in order of interface.

Example of setting

Slave Unit (I) that comes out to Sequence ① is Slave station No.1
Slave Unit (II) is Slave station No.3
Slave Unit (III) is Slave station No.4



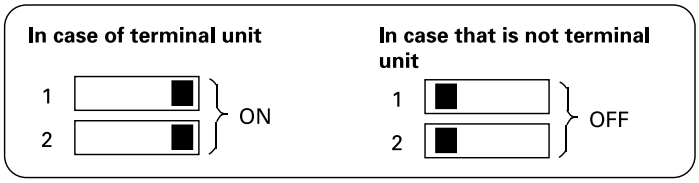
NOTE Allocated I/O No. in order of Slave Unit (I), Slave Unit (II), and Slave Unit (III) See Sequence ④ about I/O No. allocation. Don't turn Station No. selector switch after power supply. No matter on operation because it is controlled by I/O Map for power supply. However, it causes errors for next operation.

2. Setting of Terminal Unit (Station) See *"Power Up sequence" in Chapter 8*

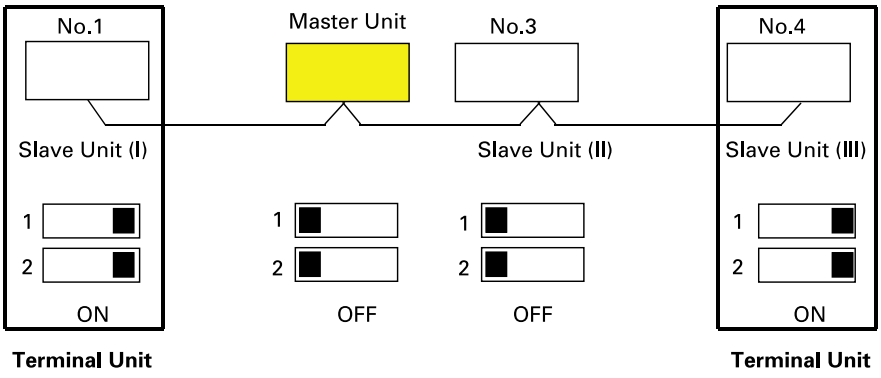
Set Terminal Unit in case of interfacing to transmission line

Setting Method

Set SW1, SW2 of Mode Selector Switch.

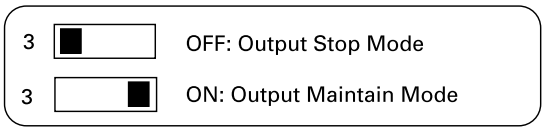


Example of Setting



3. Setting of Output Maintain/Stop in Case of Error on Communication

In case of error on communication, choose [Stop or Maintain in setting of output. Set Mode selector switch SW3.



NOTE

- When error occurs on terminal Unit setting, ERROR LED of CPU Unit is blinking in case of power supply. Supply power again after resetting.
- Slave Unit that doesn't have terminal Unit, is OFF setting on SW1 and SW2 of Mode selector switch.

Sequence ④
[Turns ON Power Supply to PLC System]

If installation of Master Unit and Slave Unit, transmission cable wiring, station No. setting, and terminal Unit setting are completed, supply power to PLC System. After power supply, Remote I/O control is possible, so checking of run is possible.

1. Check of Power Supply, Remote I/O Control

Procedure

Step1. Turns ON Power supply to every Slave Unit.

Step2. Turns ON [PROG.] mode switch of CPU Unit.

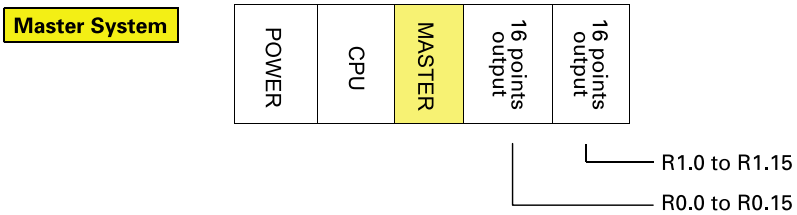
Step3. Turns ON Power supply to Master Unit lastly.

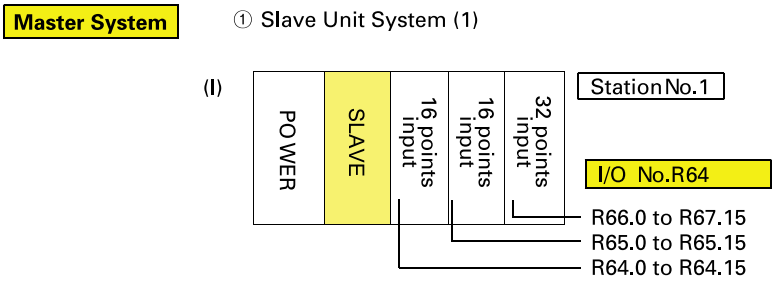
COM.LED of each Slave station is blinking in fast cycle if power is supplied to Master Station. Check it out.

Check

Remote I/O System control by allocating I/O No. automatically to Slave Unit (Present Value Mode).

In order of above sequence, I/O No. allocation in Present Value is shown below (Sequence ①). *"Chapter 9"*.





2. Registration and Setting of Remote I/O Map

Possible to register allocation of I/O Number of Remote I/O System to CPU Unit.

Once Remote I/O Map is registered,

- Even though power supply is delayed to Slave Unit, it can be controlled with registered I/O No.
- Program execution can be waited until power supply to every Slave Unit

Also, If WINGPC S/W is used, it is possible to allocate randomly.

- Need to prepare I/O point in case of adding Slave Unit.
- If there is many Remote I/O points, usage memory area can be extended with Remote I/O.

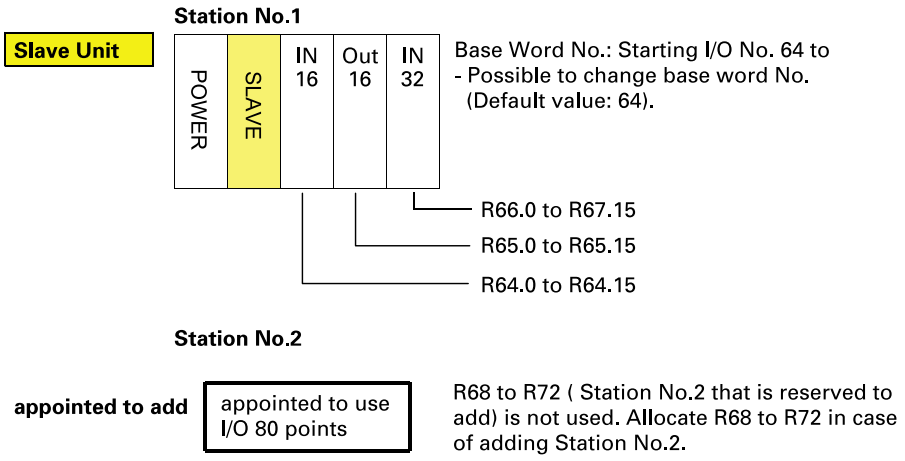
Setting Method

Register by using programming Tool.

- Use WINGPC S/W (Use computer): Register by selecting REMOTE CONFIG In SYSTEM Menu

3. Example of I/O Allocation.

In case of adding (Use I/O 80 points) by random I/O allocation.


Station No.1
Slave Unit
POWER
SLAVE
IN 16
Out 16
IN 32
Base Word No.: Starting I/O No. 64 to
- Possible to change base word No.
(Default value: 64).
R66.0 to R67.15
R65.0 to R65.15
R64.0 to R64.15
Station No.2
appointed to add
appointed to use I/O 80 points
R68 to R72 (Station No.2 that is reserved to add) is not used. Allocate R68 to R72 in case of adding Station No.2.

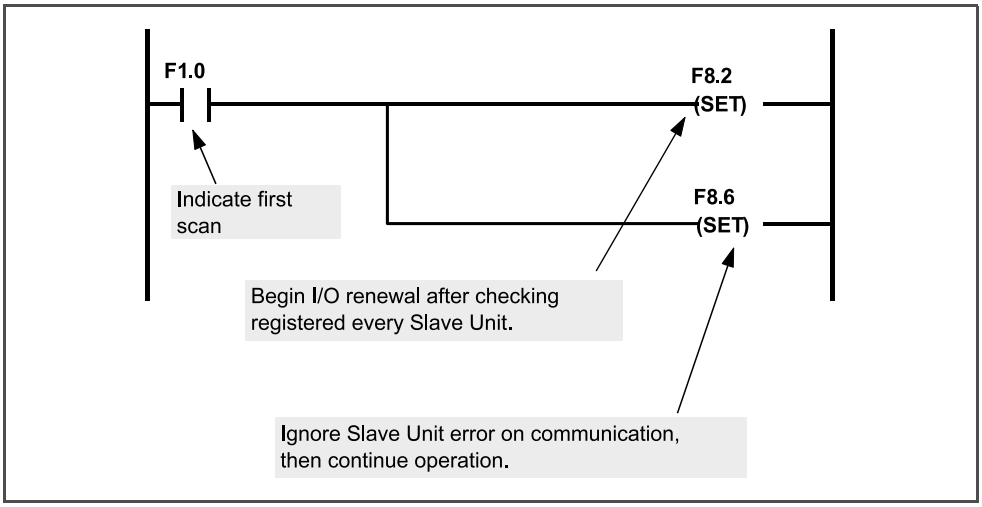
4. Setting of CPU Unit

Possible to set operation content of Remote I/O control with System Register Setting of CPU Unit. Possible to control in user program.

System Register Item that is related to operation mode of Remote I/O System.

Flag	Contents	Initial value
F8.2	Operation after checking Slave Unit that is set.	0: Operation that is not checked
F8.6	CPU Unit operation continuation/ stop in case of error on communication.	1: Ignore ERROR

Example. Setting by Ladder program



6

Remote I/O Map

Inputs/ Outputs of the REMOTE I/O System slave station are controlled with I/O numbers, as well as with Inputs/Outputs to an in ordinary system. The I/O Number allocation of REMOTE I/O System is called as Remote I/O Map.

Configuration of Remote I/O Map

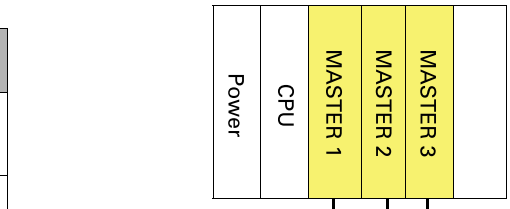
I/O Allocation of Slave station is shown below.

- Allocate head word No. that is set to each REMOTE I/O Master Unit. Head Word No. is called as Base Word No. (Configuration of word Unit). Possible to install up to 3 Master Units per a CPU Unit. Called as Master Unit 1 (Loop1) Master Unit 2 (Loop2),and Master Unit 3 (Loop3) in order of CPU Unit.
- I/O No. is allocated to each Unit in order of small Unit No. Don't need to set Unit No. in order of interfaced sequence. (I/O No. is allocated in order of Unit No. Not interfaced sequence.)

There are 3 types of Remote I/O Map Registration Mode.

- Auto Mode: mapped automatically with Present I/O Map
- Manual Mode1: mapped manually with Present I/O Map by user
- Manual Mode2: mapped manually with Random I/O Map by user

Memory Allocation
Ordinary I/O area R0.0 to 63.15 (possible to control 1,024 points)
Master Unit 1 Loop R64.0 to R95.15 (possible to control 512 points)
Master Unit 2 Loop R96.0 to R111.15 (possible to control 256 points)
Master Unit 3 Loop R112.0 to R127.15 (possible to control 256 points)



NOTE In case of many REMOTE I/O points, possible to increase usage area of Loop that needs many I/O No., and decrease different Loop area by using WINGPC S/W.

Information flag about REMOTE I/O Map Setting and Base Word

REMOTE I/O Map Setting Requesting Flag

REMOTE I/O Map Setting Requesting Flag

Flag	Contents	Initial Value	Remarks
F8.1	REMOTE I/O Map resetting request using actual value.	0	User can control directly. WINGPC S/W controls automatically in case of using GPC S/W.
F8.3	Setting request using user define MAP	0	

REMOTE I/O Base Word Setting Information

Flag	Contents	Already setting	Remarks
F8.5	Y/N of Master Unit 1(Loop 1) Base word	1	Output
F9.5	Y/N of Master Unit 2(Loop 2) Base word	1	Output
F10.5	Y/N of Master Unit 3(Loop 3) Base word	1	Output

REMOTE I/O Map Registration Information

F12.1	Y/N of REMOTE I/O Map Setting	1	Output (1)

Register	Content	Initial Value
SR11	Base Word of REMOTE Master Unit 1(Loop 1)	64
SR12	Base Word of REMOTE Master Unit 2(Loop 2)	96
SR13	Base Word of REMOTE Master Unit 3(Loop 3)	112
SR14	COMPLEMENT Value of Base Word of REMOTE Master Unit 1(Loop 1)	-
SR15	COMPLEMENT Value of Base Word of REMOTE Master Unit 2(Loop 2)	-
SR16	COMPLEMENT Value of Base Word of REMOTE Master Unit 3(Loop 3)	-

Precaution for I/O No. Allocation of Each Slave Unit

- Beginning I/O No. of Unit is a next of ending I/O No.
- Ending I/O No. of Unit is in accordance with occupied I/O point
- Unit that has smallest Unit No. is beginning No. of Base Word No.
- I/O No. is allocated in accordance with installed I/O Unit and occupied I/O point of high functional Unit like ordinary system. I/O No. is allocated in order of Slave Unit.

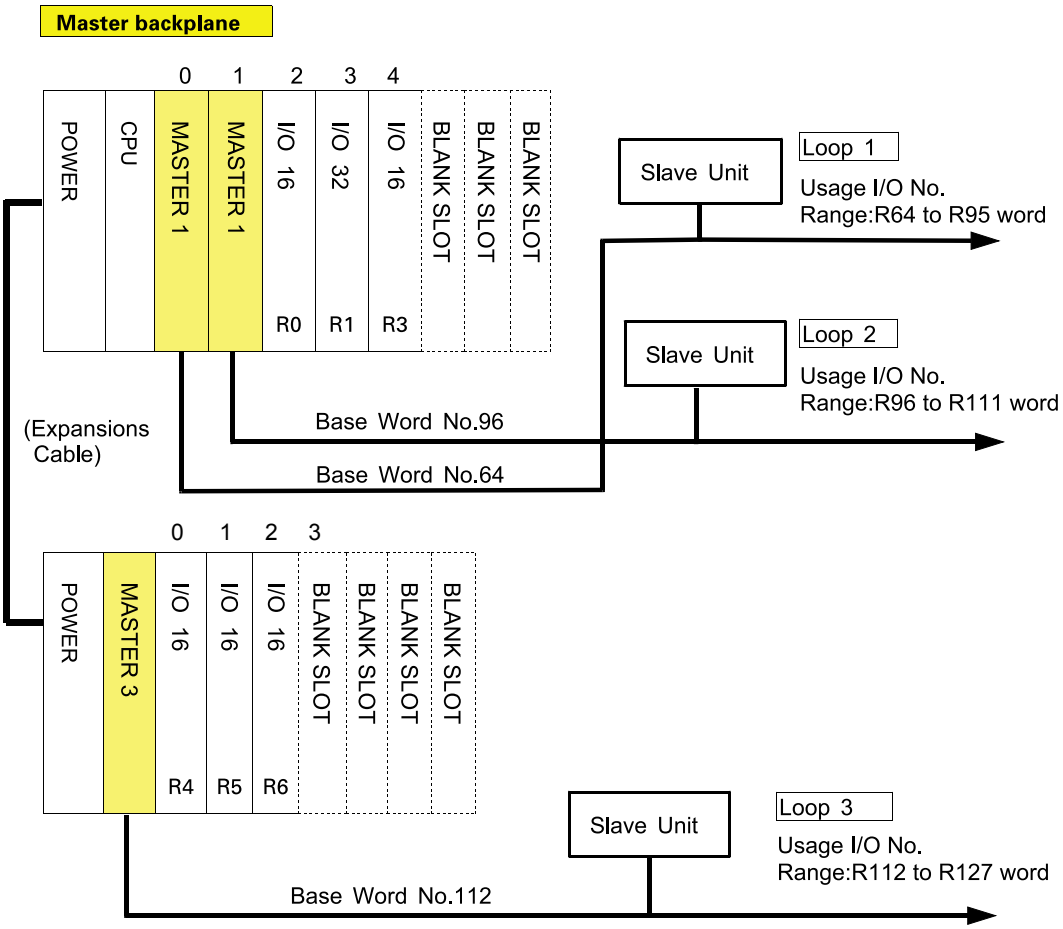
NOTE (1) Y/N of REMOTE I/O Map Setting is not marked in each Master Unit. If one of installed Master Units is set, it is marked.

Example of I/O Allocation (I) (N700 PLC SYSTEM)

Reference Item

Possible to change I/O allocation of Slave Unit System by using WINGPC S/W.

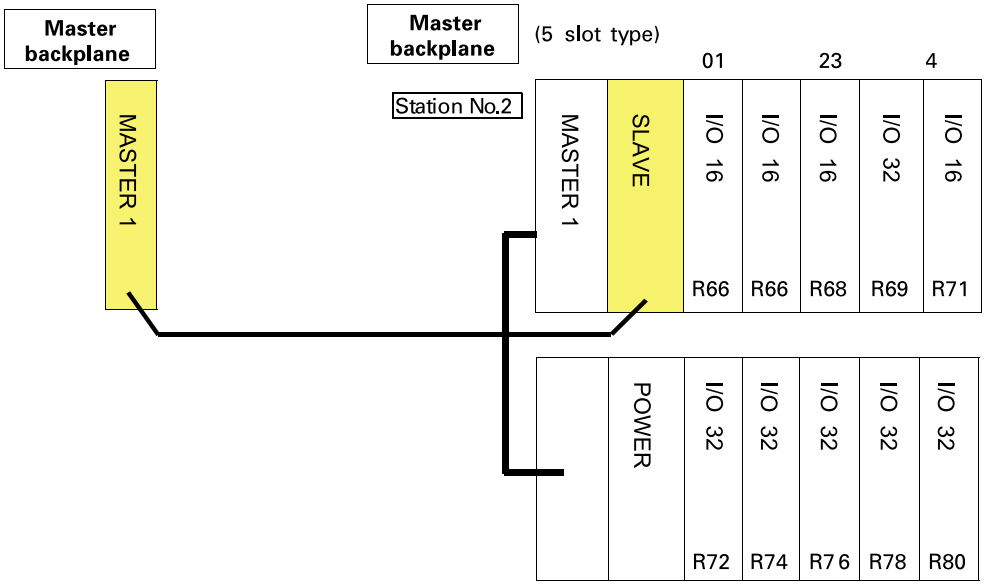
Master Unit and Slave Unit don't have occupied point.



Example of I/O Allocation (II)

Below is an example of Loop.

Shows Remote I/O allocation of interfacing condition in 1 Loop.



Present Value I/O Map and Registration I/O Map

REMOTE I/O Map is an allocation of Slave Unit I/O No. that is accepted in CPU Unit in case of system operation. After that, execute REMOTE I/O control in accordance with I/O Map.

Control by present value I/O Map

Operation with I/O Map that is allocated automatically to operating Slave Unit in when On power to CPU Unit of Master Unit.

Control by registration I/O Map

Operation with registered I/O Map in CPU Unit of Master Unit.

Below are 3 types of Remote I/O Map Registration.

- Auto Mode: mapped automatically with Present I/O Map
- Manual Mode1: mapped manually with Present I/O Map by user
- Manual Mode2: mapped manually with Random I/O Map by user

Recommend to use Manual Mode1 in case of operation.

Control by Present Value I/O Map [Auto Mode]

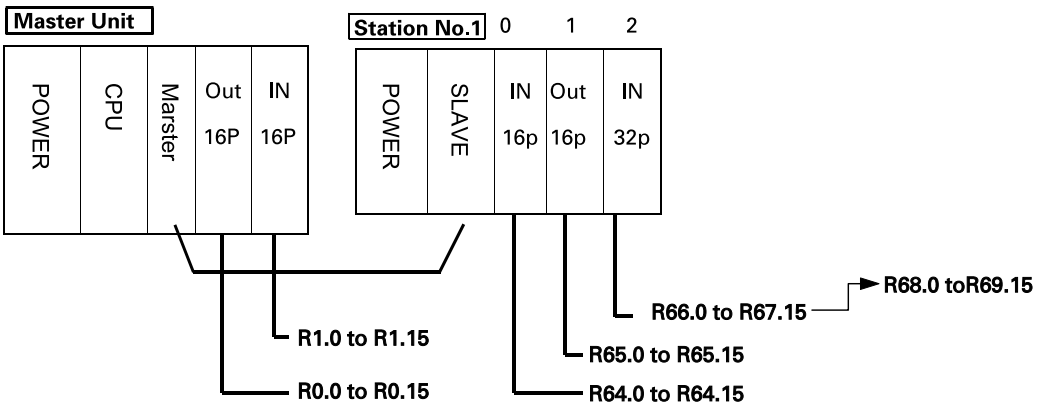
- In case that REMOTE I/O Map is not registered to CPU Unit, I/O control is executed in accordance with I/O Map that is configured automatically in Slave Unit which power is already supplied. Base Word No. used basic configuration in case that it is not configured.
- In present value Map, CPU is operated based on I/O Map of Slave Unit when power turns ON.

Precaution:

In case of factory shipping of CPU Unit, REMOTE I/O Map is not registered.

Use Programming Tool (GPC, WinGPC) for REMOTE I/O Map and initial setting of System register.

REMOTE I/O Map and initial setting of base word are used by WINGPC S/W. (supported later)



- In above example, power is not supplied of Station No.2. Configure REMOTE I/O Map with Station No.1 and Station No.3 in present value mode. Station No.2 cannot be accepted to REMOTE I/O Map even though it is operated
- REMOTE I/O Control is executed by interfacing partly on constructing system.

NOTE

- In case of executing Auto mode, supply power to Slave Unit of I/O control before power supply to Master Unit System. Slave Unit that power supply is late is not accepted to REMOTE I/O Map even though it is operated. Allocated with high I/O point. I/O Number of Slave Unit is different with the case that Slave Unit is operated.
- When power is supplied to Master Unit System, if terminal Unit is not interfaced, it causes (Disconnection or Power Supply Delay) Termination Error. In this case, disconnect and operate again.

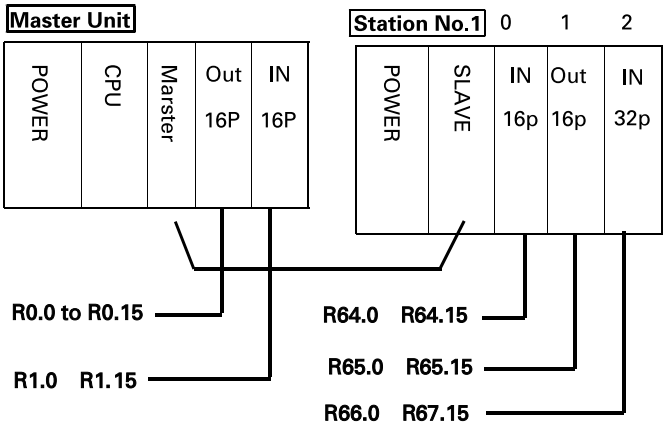
In case of operation, execute Control by Registration I/O Map.

Control by Registration I/O Map [Manual Mode]

- If REMOTE I/O Map is registered to CPU Unit, I/O Control is executed with same I/O Map by BACK-Up.(Base Word No. uses basic setting)
- In case of power supply to Master Unit System, even though there is a Slave Unit that is not operated (POWER OFF Condition), I/O No. is connected to next Slave Unit with registered condition.
- In case of power supply to Master Unit System, if Slave Unit that is not operated before, is operated (POWER ON), it can be controlled with registered I/O Number.
- Slave Unit Interfacing Check Mode (System Register F8.2 is set with “1”) Begin operation after registered Slave Unit is operated [(1)].

NOTE

[(1)] In User LADDER program, F8.2 SET in case of first SCAN. See *"Checking of Slave Station that Error Occurs" in Chapter 10* about Slave Unit Interfacing Check Mode.



- Above example is an example that Station No.2 is not operated (No power supply, No interface.) I/O Number is registered to Slave Station of No.2, I/O control is possible by REMOTE I/O Map.
- Register with Programming Tool (GPC, WinGPC) to register REMOTE I/O Map before executing Control by registration I/O Map.

Registration Method (Manual mode allocation)

There are two Types of REMOTE I/O Map Registration (Manual mode),

- Registration of Present Value Map
- Registration of Random I/O Map

Registrations request is executed by setting('1) F8.1 or F8.3 flag it is executed through Ladder program or WINGPC S/W.

Registration of Present Value Map (F8.1)

Register installed I/O to REMOTE I/O System (including every Slave Unit).

Turn on the power of every REMOTE I/O System. Back-Up in case of installing system or changing module (Unit) of system.

Registration of Random I/O Map (F8.3)

Register I/O Map to REMOTE I/O System (including every Slave Unit) without installed I/O condition, and control with the I/O No.

Registration Method

- Register with Programming Tool (Possible to register in only WinGPC S/W) Handy-Loader(PGM500): not supported.
- WinGPC S/W (Computer): Execute registration on REMOTE I/O Config item.

  See WinGPC Manual for more detail.

NOTE

- It is not operated normally if there is something wrong on registration in case of I/O Map Registration.
- If there is no registered Slave Unit, standby condition that there is no Slave Unit of Station No. (Slave Unit Interfacing Check Mode)

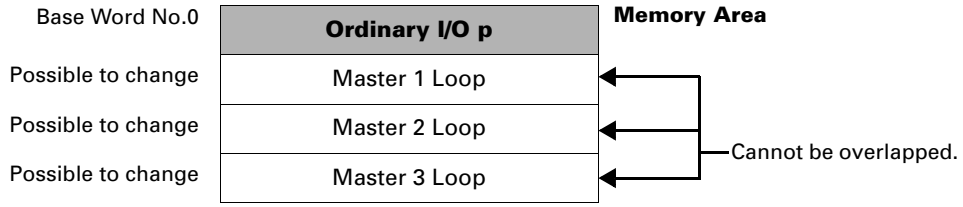
Setting of Base Word No.

Possible to register REMOTE I/O Base Word No. by random setting per Master Unit. Possible to secure I/O point that is needed to each Loop. Possible to use by controlling usage range of Remote I/O and Master I/O range.

Setting Range	0 to 127 word Unit setting for each Master Unit. (ex.) If Base word of Master 3 is changed from 112 to 104, contact point control of R104.0 R127.15 is possible in Master3 Loop.
Setting Condition	Final I/O No. of ordinary I/O area < Base Word No. of Master 1 Base Word No. of Master 1 < Base Word No. of Master 2 Base Word No. of Master 2 < Base Word No. of Master 3

Condition 1

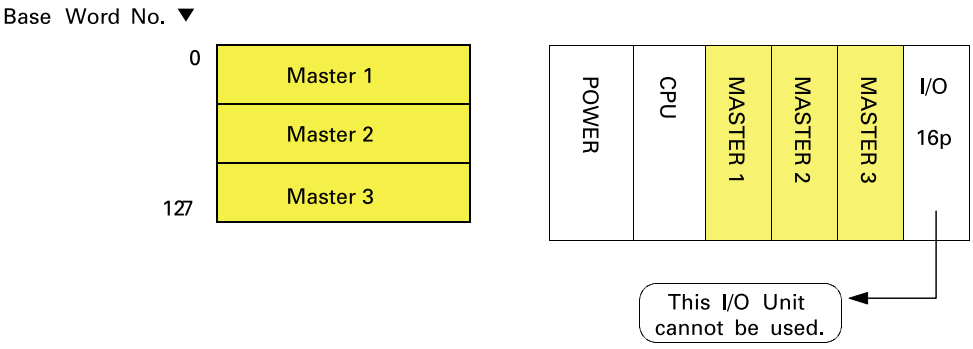
Set Base Word No. in order of CPU of Master Unit Installation location. Any Base Word No. cannot be set less than Base Word No. of Master Unit that is installed to near location of CPU Unit.



Precaution:
Register again in case of changing module in system in this case.
If it is not registered, it causes I/O Verify Error.

Condition 2

If Base Word No. of Master 1 is set as “0”, all of memory area are Remote I/O. In this case, I/O Unit or high functional Unit cannot be used in Master Unit System.



7

Operation Mode Setting of Remote I/O System

Description of the Operation Modes for Controlling the Remote I/O System

The operation modes for controlling the Remote I/O System can be changed by setting the system Flags of the CPU

- Remote I/O Control in case of Error. [F8.6 Flag]
  The operation mode when a slave station does not work correctly can be set to continue or halt the operation.
- Slave Unit Interfacing Check Mode. [F8.2 Flag]
  When a remote I/O Map is registered, you can start remote I/O control only after all of the slave stations which have been registered in the CPU are turned ON.

How to change the Remote I/O Operation Mode:

By setting the system flags of the CPU, you can change the remote I/O operation mode. To set the system flags, use a Ladder program

Remote I/O Control When Error Occurs

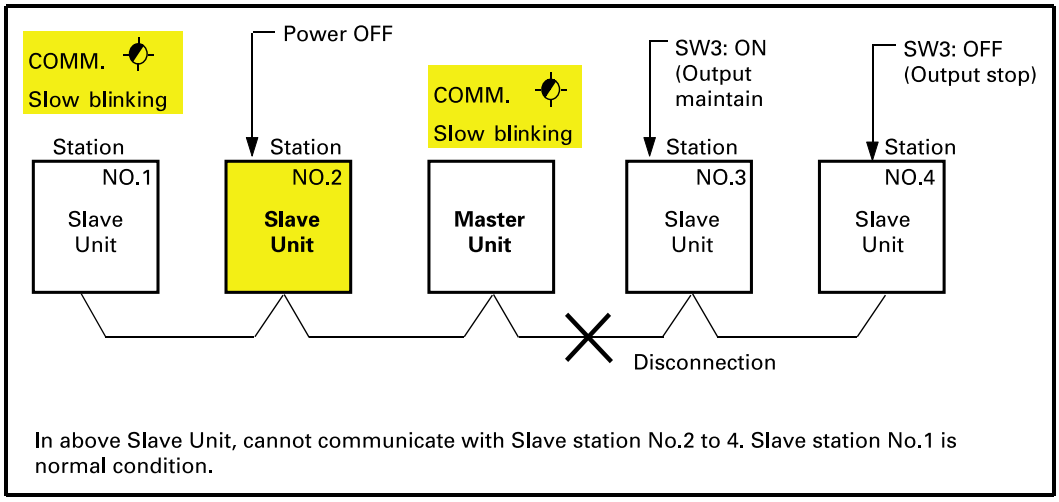
Two types of error may occur in the Remote I/O system

- Communication Error:
  In case that Master Unit and Slave Unit cannot communicate each other by power OFF or disconnection of transmission cable, check
- Error of I/O or Intelligent Unit in the Slave station:
  In a slave station where a Slave Unit is installed, an Input/ Output Unit or Intelligent Unit has produced an error. This may occur because of a blown fuse, a Unit hangs or a system error occurred

Setting Contents		Description
CPU Unit	System Flag F8.6 (Master Unit 1) F9.6 (Master Unit 2) F10.6 (Master Unit 3)	Operation in case of error on communication
Master Unit	Registration Mode Selector Switch SW7	Remote I/O control in case of error on communication
Slave Unit	Registration Mode Selector Switch SW3	Power ON/OFF in case of error on communication

Operation when Error occurs on Communication

- Communication Error occurs in case that Master Unit and Slave Unit cannot communicate each other by disconnecting of transmission cable or power of Slave station is off.
- When error occurs, REMOTE I/O Communication Error is checked. Slave station that cannot be communicated, can be checked with special Data Register SR264 to SR269



In above Slave Unit, cannot communicate with Slave station No.2 to 4. Slave station No.1 is normal condition.

Operation of Normal Slave Station

Possible to select 4 types of operation about normal Slave Station in case of Communication error

Types of Operation Mode	System Register	Master Mind	Operation in Case of Communication Error		Return Method
	F8.6	SW7	Normal I/O	REMOTE I/O of Slave Station	
Stop I/O Operation (1)	0	OFF	Stop operation	X (COMM: not changed)	Operate Master Unit again
Stop I/O Operation (2)	0	ON	Stop operation	X (COMM: not changed)	Operate Master Unit again
Stop REMOTE I/O Operation	1	OFF	Operation	○ (COMM: change)	Operate Master Unit again
Continue I/O Operation	1	ON	Operation	○ (COMM: change)	Automatic return (*)

1: Continue operation, X: Stop operation

NOTE

1. (*) If communication error is fixed (interfacing cable, power supply) about Slave Station that cannot be communicated, execute control.
2. In case of Communication Error, power of Slave Unit is OFF in stop setting of Remote I/O control. No matter about the condition of Mode Selector Switch No.7 of Slave Station. (Output continue mode/ Output stop mode)

There are 4 types of Communication Error in case of normal Slave Station operation.

1. **Stop I/O Operation [1]**
   - System Flag F8.6 of CPU Unit: 0 (Halt Operation)
   - Mode Selector Switch No.7 of Master Station: OFF
     [Operation]: Stop every I/O operation. Communication error occurs because COMM.LED (COM.LED) is blinking (1 sec. cycle) slowly in normal Master and Slave Station.
     [Steps to take]: Supply power again after fixing error. (disconnection of transmission cable, etc.)

2. **Stop I/O Operation [2]**
   - System Flag F8.6 of CPU Unit: 0 (Halt Operation)
   - Mode Selector Switch No.7 of Master Station: ON (Continue Operation)
     [Operation]: Stop every I/O operation. COMM.LED (COM.LED) is same with normal condition in normal Master and Slave Station (0.2 sec. cycle blinking)
     [Steps to take]: Initialize Master Station with RUN Mode after fixing error (disconnection of transmission cable, etc.)

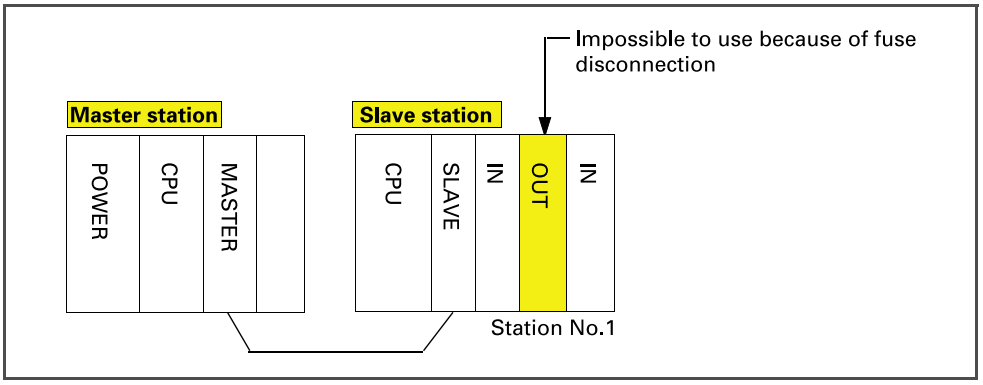
3. **Stop Only Remote I/O Operation**
   - System Flag F8.6 of CPU Unit: 1 (Continue Operation)
   - Mode Selector Switch No.7 of Master Station: OFF (Halt Operation)
     [Operation]: Stop only Remote I/O Operation. Continue operation about I/O of Master Station System. Communication error occurs because COMM.LED (COM.LED)°¼is blinking (1 sec. cycle) slowly in normal Master and Slave)
     [Steps to take]: Supply power again after fixing error. (disconnection of transmission cable, etc.)

4. **Continue I/O Operation**
   - System Flag F8.6 of CPU Unit: 1 (Continue Operation)
   - Mode Selector Switch No.7 of Master Station: ON (Continue Operation)
     [Operation]: Continue operation for I/O of normal Master Station and Slave Station COMM.LED (COM.LED) is same with normal condition in normal Master and Slave Station (0.2 sec. cycle blinking)
     [Steps to take]: Slave Station that cannot be communicated is returned automatically after fixing error (disconnection of transmission cable, etc.). Lights-out by using initialize switch of CPU Unit in RUN Mode because ERROR LED of CPU Unit is lighting.

Output condition of Slave Station that cannot be communicated.
Possible to keep output condition of Slave Station that cannot be communicated with Master Station. Turn on Mode Selector Switch of Slave Station. If output is ON, continue POWER ON. Not related to setting of CPU Unit (System Flag F8.6, Mode Selector Switch No.7).

Operation in case that error occurs in Unit that is connected with slave station.

In case that Input/ Output or Intelligent Unit that is interfaced to system installing Slave Station have errors of fuse disconnection (TR, SSR Output Unit) or scan error, possible to decide to stop or continue I/O operation. If error occurs, Unit Error of Remote I/O (Error Code F8.11 (In case of Master station 1) is checked. Slave Station System that is interfaced with faulty operation is checked with special data register SR294 to SR299.



Faulty operation occurs on output Unit that is installed to slot 1 of Slave station No. 1. If operation is continued, possible to control I/O about Slave. No.2, No.3, and other Unit of Slave Station No.1. In case that error occurs in the Unit of Slave station.

Operation of communication error in each setting

1. **Stop I/O Operation**

   System Flag F8.6 of CPU Unit: 0 (Operation halt Mode)

   No matter where setting of System Flag and Mode Selector Switch No.7 are.

   [Operation]: Stop every I/O operation. COMM.LED (COM.LED) is same with normal condition in normal Slave Unit that is interfaced (0.2 sec. cycle blinking). POWER OFF.

   [Steps to take]: Supply power of Master System again after changing faulty Unit to normal Unit.

2. **Continue I/O Operation [1]**

   System Flag F8.6 of CPU Unit: 1 (Operation Continue Mode). Mode Selector Switch No.7 of Master Station: OFF (Operation Stop Mode)

   No matter where System Flag F8.6 is. No matter that Mode Selector Switch is on in case that F8.6 is “0”.

   [Operation]: Continue operation of Remote I/O and I/O operation of Master Station System. I/O operation of I/O Unit and high functional Unit is executed normally about Slave Station System that faulty Unit is occurred.

   [Steps to take]: Supply power of CPU Unit again after changing faulty Unit to normal Unit.

3. Continue I/O Operation [2] (Automatic Return)

System Flag F8.6 of CPU Unit: 1 (Operation Continue Mode)
Mode Selector Switch No.7 of Master Station: ON (Operation Continue Mode)

[Operation]: Continue Remote I/O and I/O Operation of Master Station System. I/O operation of I/O Unit and high functional Unit is executed normally about Slave Station System that faulty Unit is occurred.

[Steps to take]: Return automatically if power is supplied to Slave Station System that the Unit is interfaced after changing faulty Unit to normal Unit. Lights-out by using initialize switch of CPU Unit in RUN Mode because ERROR LED of CPU Unit is lighting.

Slave Station Connecting Confirmation Mode

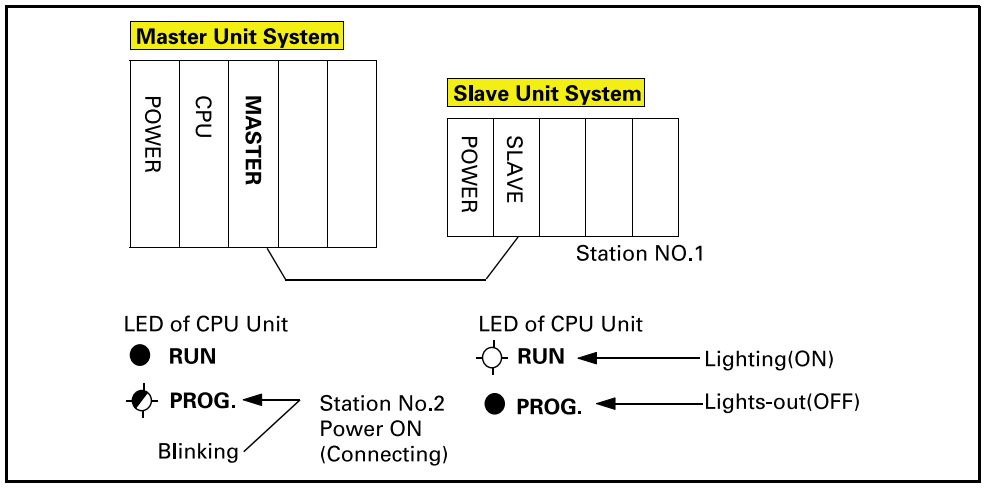
Begin operation by waiting power supply to every Slave Station that is registered to REMOTE I/O Map if Slave Station connecting confirmation Mode is set in case of operating REMOTE I/O System (In case of turns On power to Master Station System).

- Setting is executed with setting of System Flag F82. (Set with LADDER program.)
- Need Slave Station connecting confirmation Mode that REMOTE I/O Map is registered. In case that REMOTE I/O Map is not registered, even though it is registered with Slave Station confirmation Check Mode, it is invalid. (See "CH. 10".)

Slave Station connecting Confirmation Mode

[Setting]: System Flag F8.2 to 1 (ON)

[Operation]: Operation is not started and it becomes waiting condition of Slave Unit Interface if there is registered Slave Unit (POWER ON to Master Unit System) that is not operated with RUN Mode. (Master Unit executes Initializing operation continually until Slave Unit is checked). When power is supplied to every Slave Unit that is registered to REMOTE I/O Map, possible to control.



NOTE Interface waiting conditions are shown below.

- Power is not supplied to Slave Station.
- Transmission cable is disconnected.
- Slave Station of any No. to registration Map, not included to wiring actually.
- Station No. Setting is not in Registration Map.

In case of (3) and (4), turns ON power supply after station No. is set.

Slave station connection not confirmed mode

[Setting]: System Flag F8.2: 0

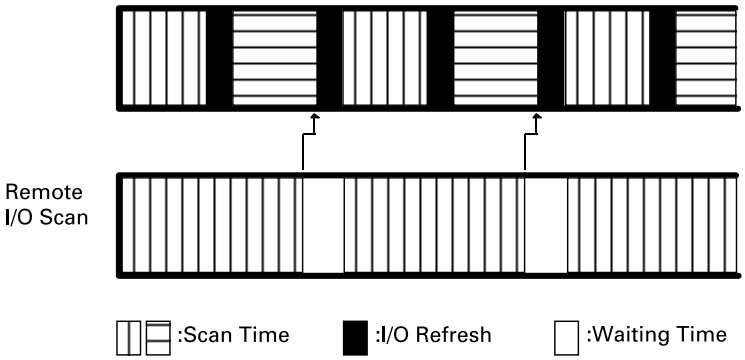
[Operation]: Begin to control Slave Unit that is already operating with Mode selector switch after turn ON power supply. Slave Station that is registered to REMOTE I/O Map is possible to control REMOTE I/O even though power turns ON lately.

Remote I/O Update Timing Method

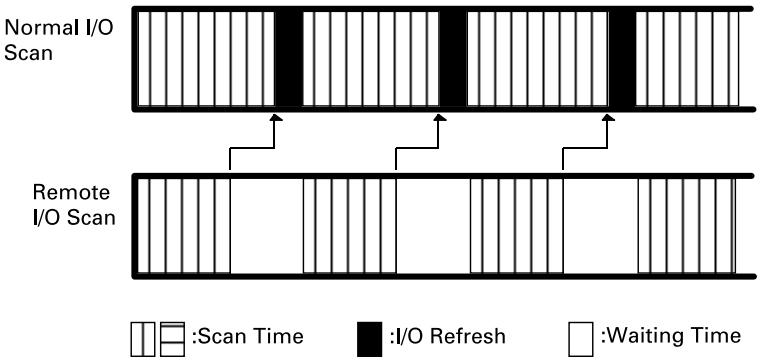
Under Remote I/O control, select the I/O update timing (Input and Output processing) The I/O update (refresh) timing can be controlled using the following modes.

- SYSTEM SCAN Time < REMOTE I/O SCAN: Scan time asynchronous mode.
- SYSTEM SCAN Time > REMOTE I/O SCAN: Scan time synchronous mode.

Asynchronous mode
Normal I/O Scan < REMOTE I/O Scan



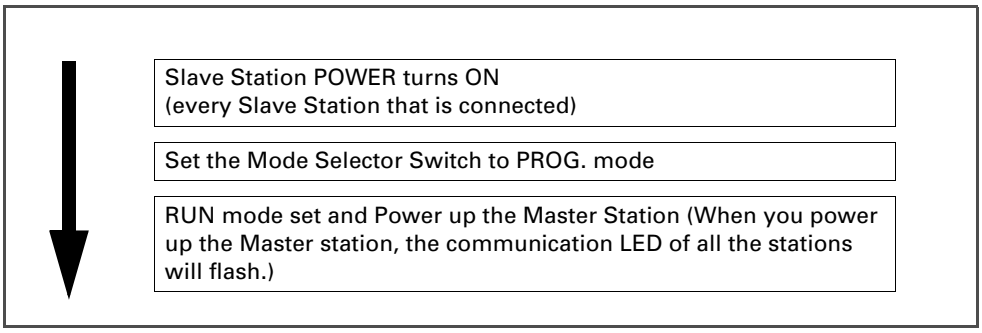
Synchronous mode
Normal I/O Scan > REMOTE I/O Scan



8

Power Up Sequence

Power Up sequence


Slave Station POWER turns ON
(every Slave Station that is connected)
Set the Mode Selector Switch to PROG. mode
RUN mode set and Power up the Master Station (When you power up the Master station, the communication LED of all the stations will flash.)

Remote I/O Map registration and Slave Station connecting Confirmation Mode

- If power is not supplied to Slave Station that is registered to REMOTE I/O Map, operation cannot be started even though power is supplied to Master station System with RUN mode until power is supplied to the Slave station.
- Control with RUN mode if Master station System is operated after supplying power to every Slave station that is registered.

Remote I/O Map Registration and Slave Station connecting Not Confirmed Mode

- In REMOTE I/O control, only for the Slave stations that power is supplied in operation point of Master station System (above ③) is executed.
- Even if there is a slave station which is not activated when the Master station is turned On, slave stations that is registered with REMOTE I/O Map can be controlled from the time turns ON power to the Slave station after.

Remote I/O Map that is not registration

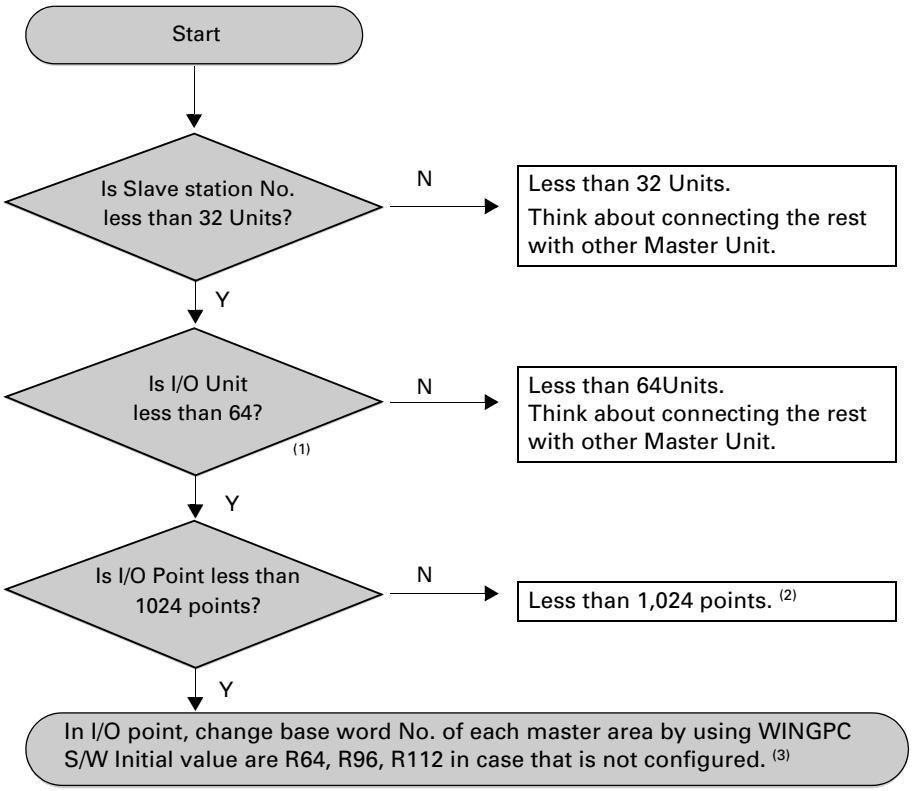
- In REMOTE I/O control, only for the Slave stations that power is supplied in operation point of Master station System (above ③) is executed.
- In this case, faulty operation should be occurred because I/O No. is not realized by ignoring Slave station that power is supplied lately.
- Operate Slave station before supplying power of Master station System.
- Operate Master Station System at last after operating every Slave Station. (See *"Present Value I/O Map and Registration I/O Map" in Chapter 6*.)

NOTE When the I/O Map is registered, it is saved in the memory in the CPU.

Reference Checking Flow chart

Flow chart checks if condition is satisfied or not about each Unit.

First of all, check Slave Unit that is connected with Master Unit


Start
Is Slave station No. less than 32 Units?
N
Less than 32 Units.
Think about connecting the rest with other Master Unit.
Y
Is I/O Unit less than 64?
(1)
N
Less than 64Units.
Think about connecting the rest with other Master Unit.
Y
Is I/O Point less than 1024 points?
N
Less than 1,024 points. (2)
Y
In I/O point, change base word No. of each master area by using WINGPC S/W Initial value are R64, R96, R112 in case that is not configured. (3)

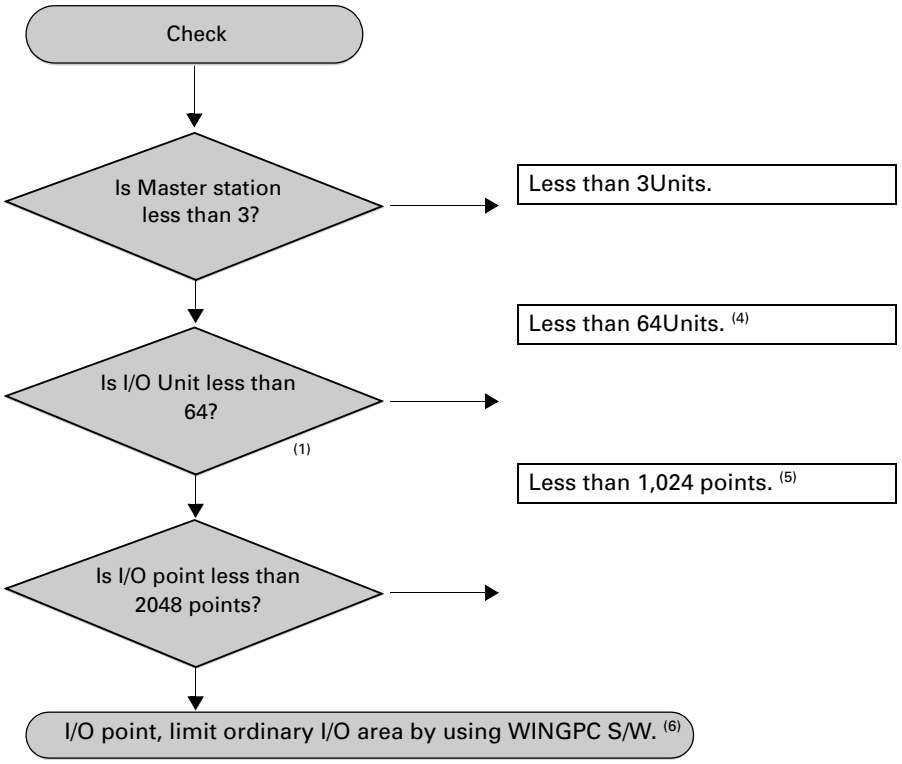
NOTE

(1) The total of each Unit of Slave Unit.

(2) [16 points] If 64occupied I/O is connected, it is 1,024 points.

(3) Initial value is configured using 256 to 512 points (each area).

Check entire Remote I/O System with 1 CPU Unit.


Check
Is Master station less than 3?
Less than 3Units.
Is I/O Unit less than 64?
(1)
Less than 64Units. (4)
Is I/O point less than 2048 points?
Less than 1,024 points. (5)
I/O point, limit ordinary I/O area by using WINGPC S/W. (6)

NOTE

(4) In PLC System, if 8 slots backplane x 3 Slave Unit is connected with each Master Unit,

(5) [16 points] If 64 occupied I/O is connected, it is 1,024 points.

(6) Ordinary I/O area + Remote I/O area = Max. 1,024 points. Impossible to use ordinary I/O in case of 1,024 points.

9

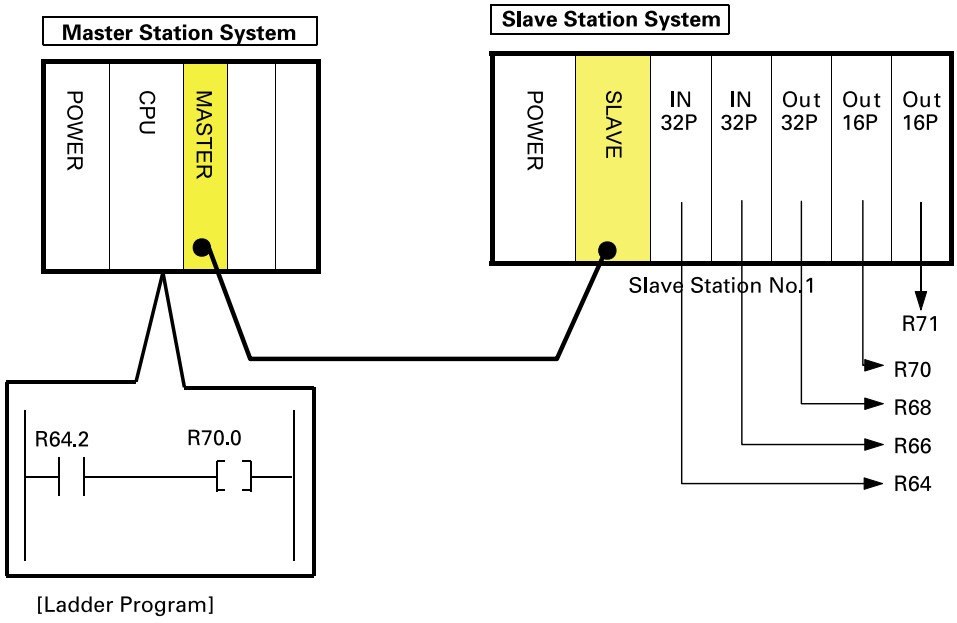
Function of Remote I/O System

Function of REMOTE I/O System

- REMOTE I/O control Function
- Shared Memory Access Function
- Remote Programming Function (not supported in 700plus system)

Remote I/O Control Function

Basic function of REMOTE I/O System, possible to control I/O of Slave station in CPU Unit that Master Station is installed. This is called as REMOTE I/O Control.



[Ladder Program]

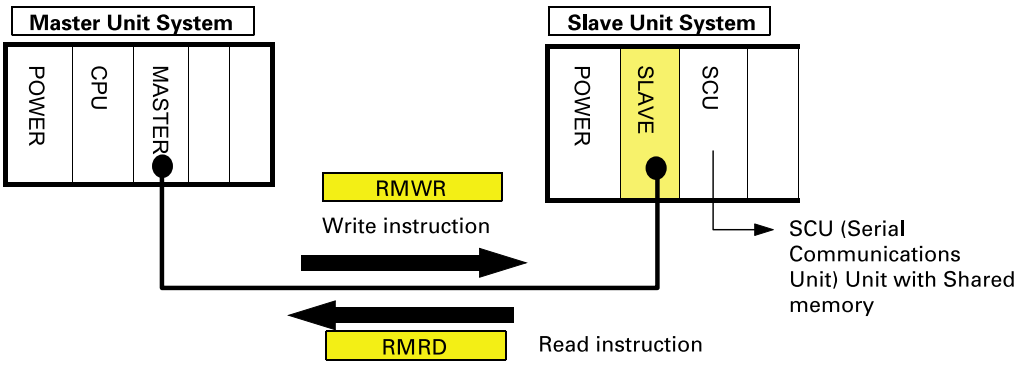
※ If R64.2 is ON, R70.0 is ON.

NOTE Remote Programming Function is a function using communication port of Slave Station (System that Slave Unit is installed to Master backplane).

Not supported in NX700plus series

Shared Memory Access Function

- Function that Shared Memory Data that is in advanced Unit (SCU High Speed Counter (HSC), Positioning Unit, Analog Unit, etc.) Slave station System is read and written in CPU Unit of Master station System.
- Use the shared memory access instructions as follows:
  [RMRD] instruction Data read from advanced Unit 's memory on a slave station
  [RMWR] instruction Data written to into advanced Unit 's memory on a slave station
- Example: With the shared memory access instruction, saved data into the CPU Unit and read the data from the SCU Unit.



NOTE

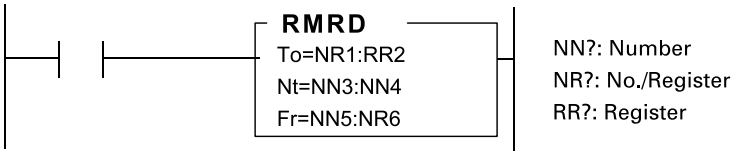
- Data that can be sent or received is Max. 32 words per a instruction.
- While a shared memory access instruction is being executed, another shared memory access instruction cannot be executed. shared memory access instruction. (Allowed 1 command per 1 SCAN)
- Shared memory access instruction (**RMRD and RMWR**) about advanced Unit have different execution method with shared memory access instruction (**READ and WRITE**).
- Pay attention on executing RMRD and RMWR instruction.
  In case of **READ, WRITE** instruction Execute and complete access to Shared memory if execution condition is completed and instruction is executed. (complete access with 1 scan)
  In case of **RMRD, RMWR** instruction Executed actual request (receiving request and sending request) to Slave Station System in case that execution condition is completed and instruction is executed. Because actual access (execution of sending and receiving) is executed in case of executing “END” instruction, scan is executed until access is completed. Therefore, in case of executing access to Shared memory about advanced Unit to Slave Unit, check execution condition by monitoring special relay and data register.
  F8.14: Flag in case of executing Memory Access instruction (In case of execution == 1, execution completion ==0)

  F8.15: Memory Access instruction Execution Result Flag (Normal completion ==0, abnormal completion ==1) Loop 1 (Master 1): F8.14, F8.15
  Loop 2 (Master 2): F9.14, F9.15
  Loop 3 (Master 3): F10.14, F10.15

RMRD (Shared Memory Read Instruction)

Instruction Reference

- Command Explanation



- Operation Explanation
  Write to register (PR2) by reading assigned word No. (NR1) from Shared memory location (NR6) of SloN5) about Station (NN4) of assigned Remote Network (NN3).

- Assignment of each item

Item	Contents
NR1	Data word No. to Read
RR2	Head address of word upper land of CPU Unit that stores data which is Read
NN3	Remote Network No.
NN4	No. of Slave Unit
NN5	Slot location of advanced Unit that is installed in Slave Unit
NR6	Shared Memory Head Address in advanced Unit that is readable.

Flag Operation

Flags	Contents	Remarks
F8.14	Indicates that CPU is executing RMRD (RMWR) instruction for Loop 1 (Master1).	Execution Completion == 0 Executing == 1
F8.15	Indicates that error occurs in case that CPU executes RMRD (RMWR) instruction for Loop 1 (Master1).	Normal Completion == 0 ERROR occurs == 1

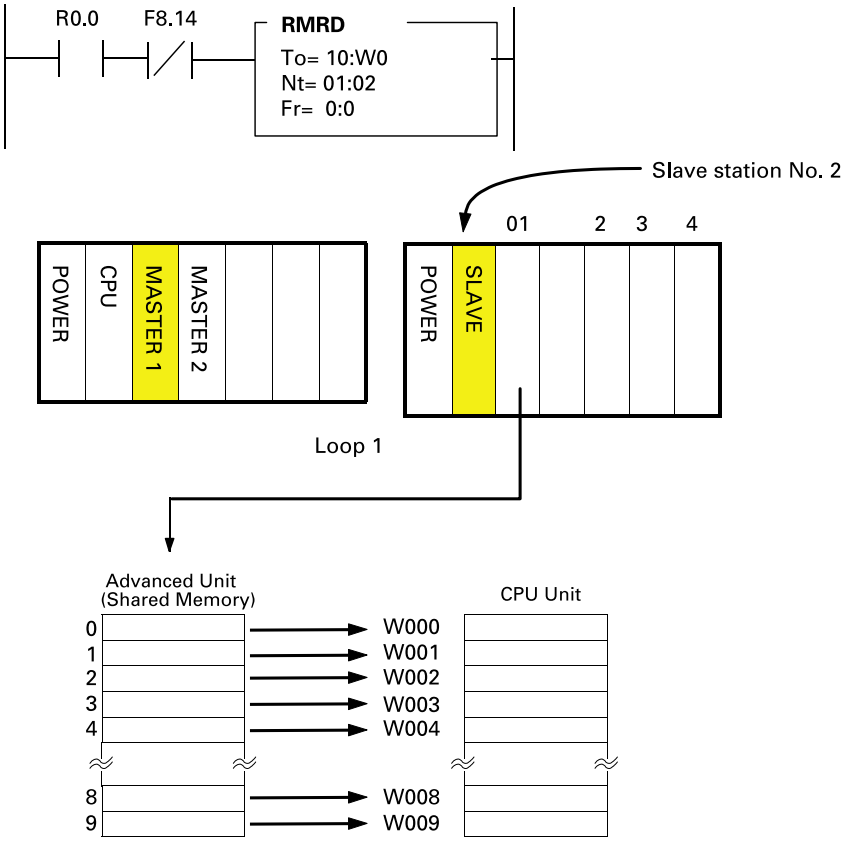
In case of executing command for Loop 2 (Master2) and Loop 3 (Master3)

Loop 2 (Master2): F9.14, F9.15

Loop 3 (Master3): F10.14, F10.15

Explanation of program example

In program, If [R0.0] is ON, 10 word data of Shared memory address 0 to 9 of advanced Unit that is in SLOT No. 0 of Remote I/O Slave station No. 2 is read, then store to data register W0~W9 of CPU Unit of Master Station.



Flag operations

- Impossible to execute RMRD instruction or RMWR instruction at the same time for 1 Master. Make out program to execute when F08.14 (executing Loop1) that is RMRD/RMWR instruction execution approval flag is OFF

F8.14	1: Cannot execute (RMRD/ RMWT instruction executing) 0: Execute

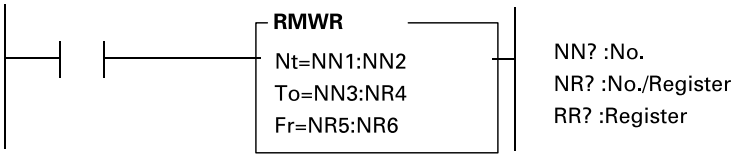
- Receiving request is executed with RMRD instruction. Actual handling is executed when Scan is completed. Use F08.14/F08.15 (using Loop 1) that is RMRD/RMWR instruction completion flag to check if execution is completed.

F8.14	0: Normal End 1: Executing
F8.15	0: Normal 1: Command Executing Error

RMWR (Shared memory Write instruction)

Instruction Reference

- Command Explanation



- Operation Explanation

  Write to Shared memory location (NR4) of assigned Slot (NN3) of Slave (NN2) of assigned Remote Network (NN1) by reading assigned word No. (NR5) from No./Register (NN2).

- Assignment of Each Item

Item	Contents
NN1	Remote Network No. (Loop No.)
NN2	Slave Unit No. that is interfaced with Loop
NN3	SLOT No. that advanced Unit is installed to write data
NR4	Head location (word location) of shared memory to write
NR5	Word No. to write
NR6	Data to write or register in CPU that has a data

Flag Operation

Flags	Contents	Remarks
F8.14	Indicates that CPU is executing RMRD (RMWR) instruction for Loop 1 (Master1).	Execution Completion == 0 Executing == 1
F8.15	Indicates that error occurs in case that CPU executes RMRD (RMWR) instruction for Loop 1 (Master1).	Normal Completion == 0 ERROR occurs == 1

In case of executing command for Loop 2 (Master2) and Loop 3 (Master3)

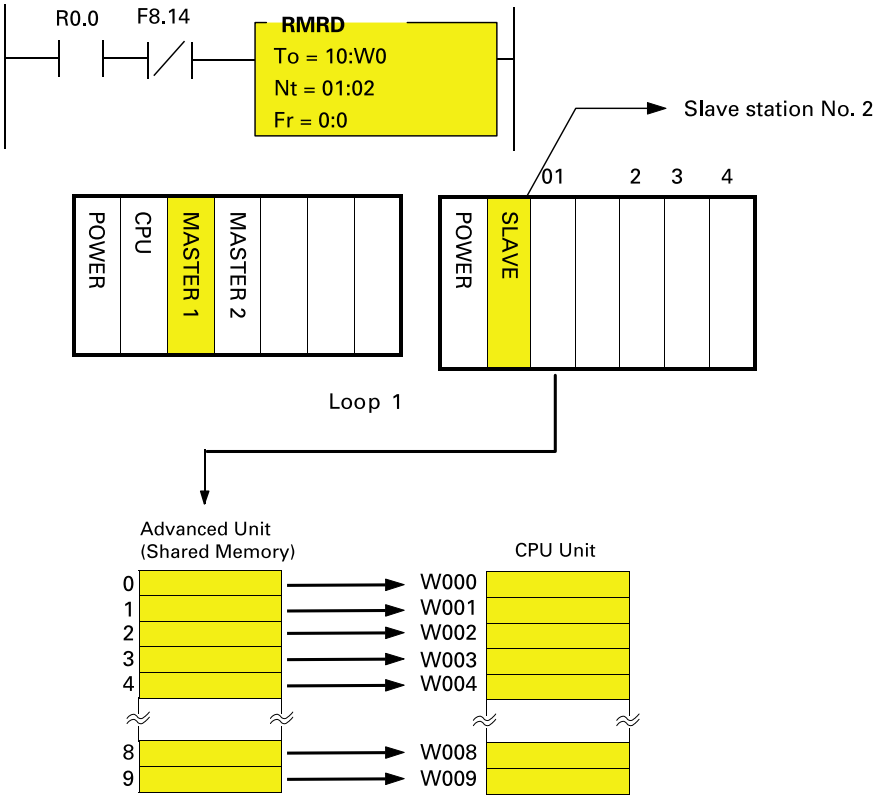
Loop 2 (Master2): F9.14, F9.15

Loop 3 (Master3): F10.14, F10.15

Explanation of Program Example

In program, if [R0.0] is ON, write 10 words of data register W0 to W9 of CPU Unit of Master Station from Shared memory address 0 of advanced Unit that is in SLOT No.0 of Remote I/O Slave Station No.2.

Write shared memory location (0) of assigned Slot (0) of Slave (02) of assigned Remote Network (01) by reading assigned word No. (10) from No./Register (W0).



Flag operations

- Impossible to execute RMRD instruction or RMWR instruction at the same time for 1 Master. Make out program to execute when F08.14 (executing Loop1) that is RMRD/RMWR instruction execution approval flag is OFF

F8.14	1: Cannot execute (RMRD/ RMWT instruction executing) 0: Execute

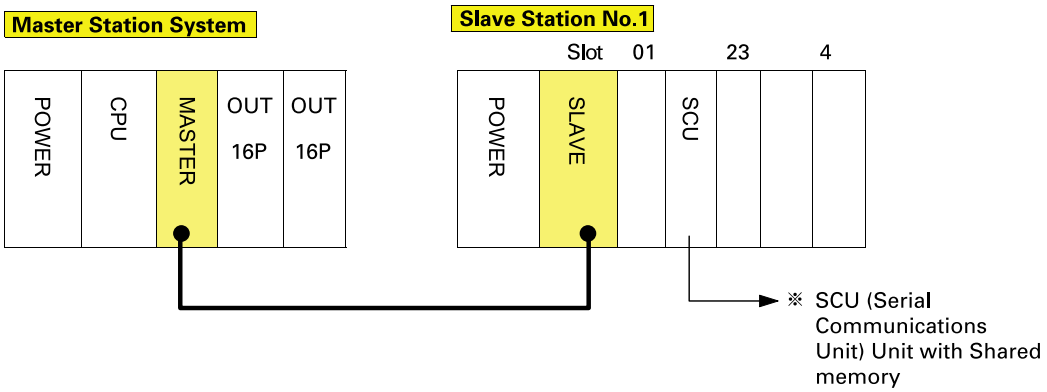
- Receiving request is executed with RMRD instruction. Actual handling is executed when Scan is completed. Use F08.14/F08.15 (using Loop 1) that is RMRD/RMWR instruction completion flag to check if execution is completed.

F8.14	0: Normal End 1: Executing
F8.15	0: Normal 1: Command Executing Error

Example of Sequence Program using Shared Memory Access Instruction

Advanced Unit (below is SCU) is installed on a Master backplane together with a Slave Station.

Example of program of access the memory in the advanced Unit (SCU) from the CPU on its Master Station.



EXAMPLE

Simple Memory Access

Slave Station No.: Station No.1

Installing location of advanced Unit (SCU): slot No.1 (2nd slot)

- Write data (15 words) of W100 to W114 of CPU Unit to Shared memory location 500 of advanced Unit of Slave Station System.
- Store to W200 to W214 of CPU Unit by reading 15 words data that is written to advanced Unit (ex. SCU).

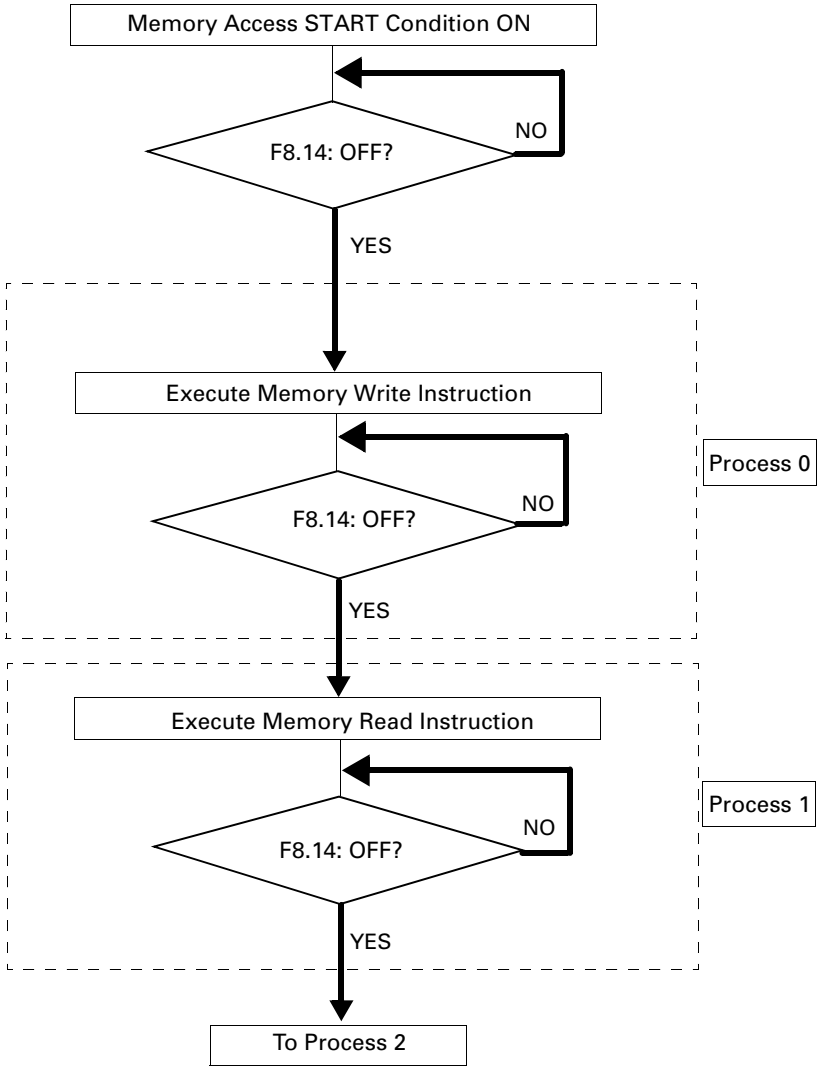
NOTE

Program that F08.14 (Executing approval flag of Slave Station 1) is OFF in case of executing shared memory access instruction.

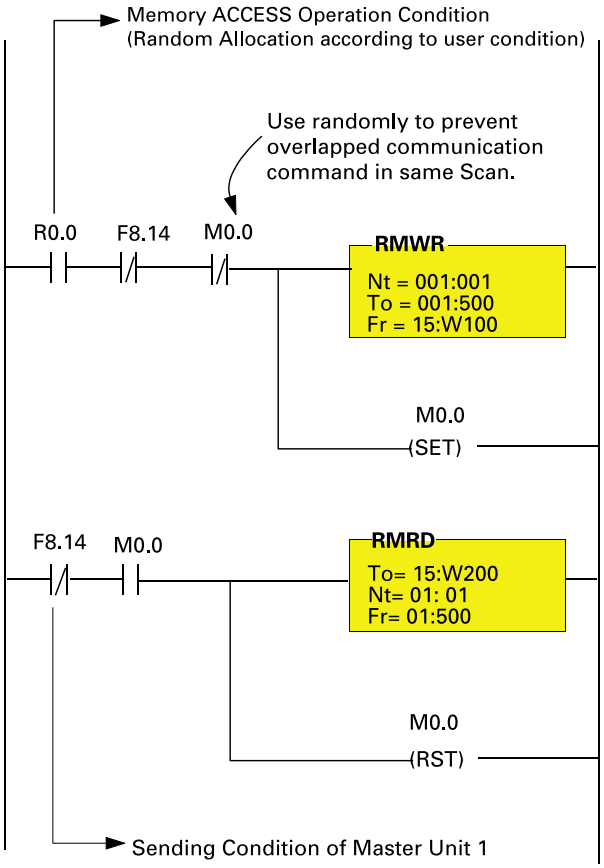
- In case of using Master Unit 2: F9.14
- In case of using Master Unit 3: F10.14

Pay attention that execution of Shared memory access instruction is overlapped in same SCAN.

Flow Chart (Simple Memory Access)



Example of Program (Simple Memory Access)



Write data with Shared memory (Process 0). Execute RMWR Write 15 words data from address 500 of shared memory in W100.

Read data with shared memory (Process 1). Execute RMRD. Store 15 words data from W200 by reading in address 500 of shared memory.

10

Finding the cause of an Error and Correcting the Error

Explain checking method and correcting the Error when error occurs using Remote I/O System

Checking Sequence of Error

1. **Checking LED Lighting Condition**
   Check lighting condition of ALARM and COMM. (or COM.) of Master Unit, Slave Unit.

LED's name	Condition	Content of Error	Correcting the Error
ALARM	Lighting	Error on Unit	Change
COMM. (COM.)	Slow blinking (1sec cycle)	Error on communication (disconnection of transmission cable or power off).	Check transmission line and place
	Lights-out	Error on transmission (error on setting of transmission or termination Unit), Slave Unit and Master Unit cannot communicate each other	Checking Error

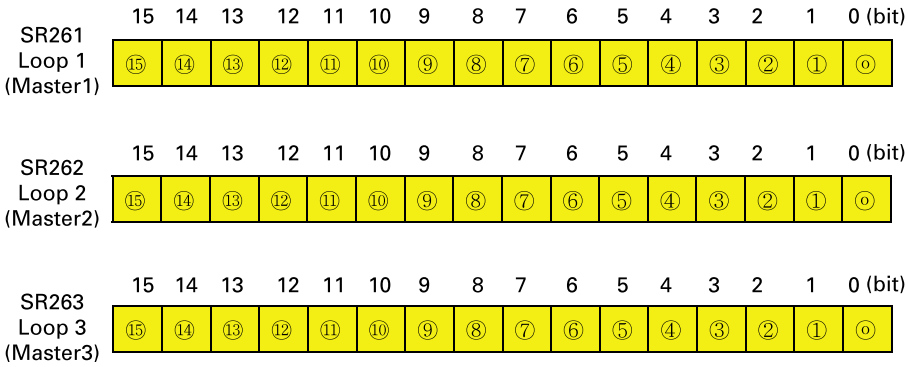
2. **Determining what kind of error has occurred**
   Checking of BIT of special register F8, F9, F10 of CPU Unit and special data register SR197, SR198, SR199.

3. **Checking Station No. of Slave Unit that error occurs**
   Check Slave Unit and place that error occurs. Especially, check content of special data register SR294 to SR299.

Error Code of Remote I/O

In case of error using Remote I/O System, content of error is stored to special data register SR261, SR262, SR263 of CPU Unit.

Content of special data register SR261, SR262, SR263 shows content of ERROR with 8 bit about each transmission line of Master Unit 1 to 3. (Upper 8 bit is used in system.)



If error occurs, bit of ① to ⑧ that corresponds to error content is "1".

EXAMPLE If SR199 is "8H", it indicates that termination Unit setting error of Master Unit 3 occurs ("8H"="00000000 00001000"; bit 3 (④)="1").

Bit No	Content	CPU Operation	Arrangement
0	Remote I/O error on communication [1] (Slave Unit that cannot be communicated occurs.)	Selection [2]	Check power OFF and disconnection of transmission line.
1	Transmission Error [1]	Selection [2]	Check transmission error or setting of station No.
2	Inhibited Unit is installed to Slave Station System.	Stop	Remove inhibited Unit.
3	Remote I/O Termination Unit Error	Transmission	Set setting of Remote I/O terminal station
4	Exceed total slot No. per a Master Station	Stop	Use in usage range (Max. 64 slots)
5	Exceed total I/O point per a Master Station	Stop	Use in usage range. (Max. 1, 024 points)
6	Instant interruption of electric power of Slave Station [1]	Transmission	Execute power check
7	Unit error of Slave Station System [1]	Selection [2]	Verify error, fuse disconnection, and advanced Unit traffic occurs. Execute I/O check

Precaution

[1] Possible to limit Slave Unit

[2] Stop or operation of CPU Unit can be selected by setting of system register.

Checking of Slave Station that Error Occurs

In case of Communication Error, Transmission Error, Instant Interruption of Power, and Unit Error of Slave Station using Remote I/O System, possible to check error place (Loop and No. of Slave Station that error occurs) by monitoring special data register using WINGPC S/W or Handy-Loader (PGM-500).

Content of Checking

- Loop No. (Master number) of Master Unit that error occurs right now.
- Station No. of Slave Unit that error has occurred until now (Accumulation Value).
- Station No. of Slave Unit System that error (fuse disconnection, traffic, etc.) occurs to installed Unit.
- Station No. of Slave Unit that instant power interruption.

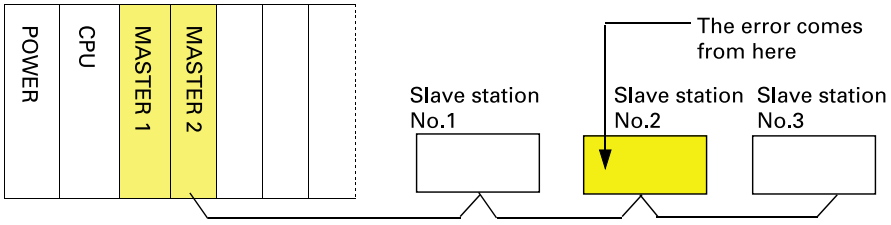
Checking Sequence

1. Check transmission line that error occurs.
   - If error occurs in transmission line of Remote I/O, special internal relay F8, F9, F10 register that correspondents to the transmission line is ON.

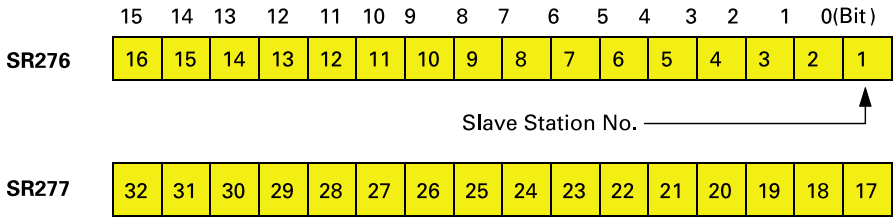
Relay No.	Content
F8.9, F8.10, F8.11, F8.12	ON when an error occurs in Master 1
F9.9, F9.10, F9.11, F9.12	ON when an error occurs in Master 2
F10.9, F10.10, F10.11, F10.12	ON when an error occurs in Master 3

   - Content and transmission line of faulty operation can be checked by monitoring special data register F8, F9, F10.

EXAMPLE The contact point is ON among contact points F9.9, F9.10, F9.11, F9.12. (Faulty operation is executed in Master 2)



2. Check error place. [Checking of instant power interruption and Slave Unit that error occurs] To check Slave Unit that instant power interruption occurs, monitor SR274, SR276, SR278 register.
   Loop 1 (Master 1): SR274,SR275
   Loop 2 (Master 2): SR276, SR277
   Loop 3 (Master 3): SR278, SR279



Bit that corresponds to station No. of Master Unit that constant power interruption occurs is “1”.

EXAMPLE If SR276=”0002H”, Error occurs to Slave Station No. 2 of Master 2 (Loop2).
(“2H”=00000000 00000010: bit 1 (No.2)=“1”)

3. Checking of Slave Station that is connected right now To check information of Slave Station that operates by connecting, monitor SR264, SR266, SR268 register.
   Loop 1 (Master 1): SR264, SR265
   Loop 2 (Master 2): SR266, SR267
   Loop 3 (Master 3): SR268, SR269

Bit that corresponds to station No. of Slave Unit that is connected right now is “1”.

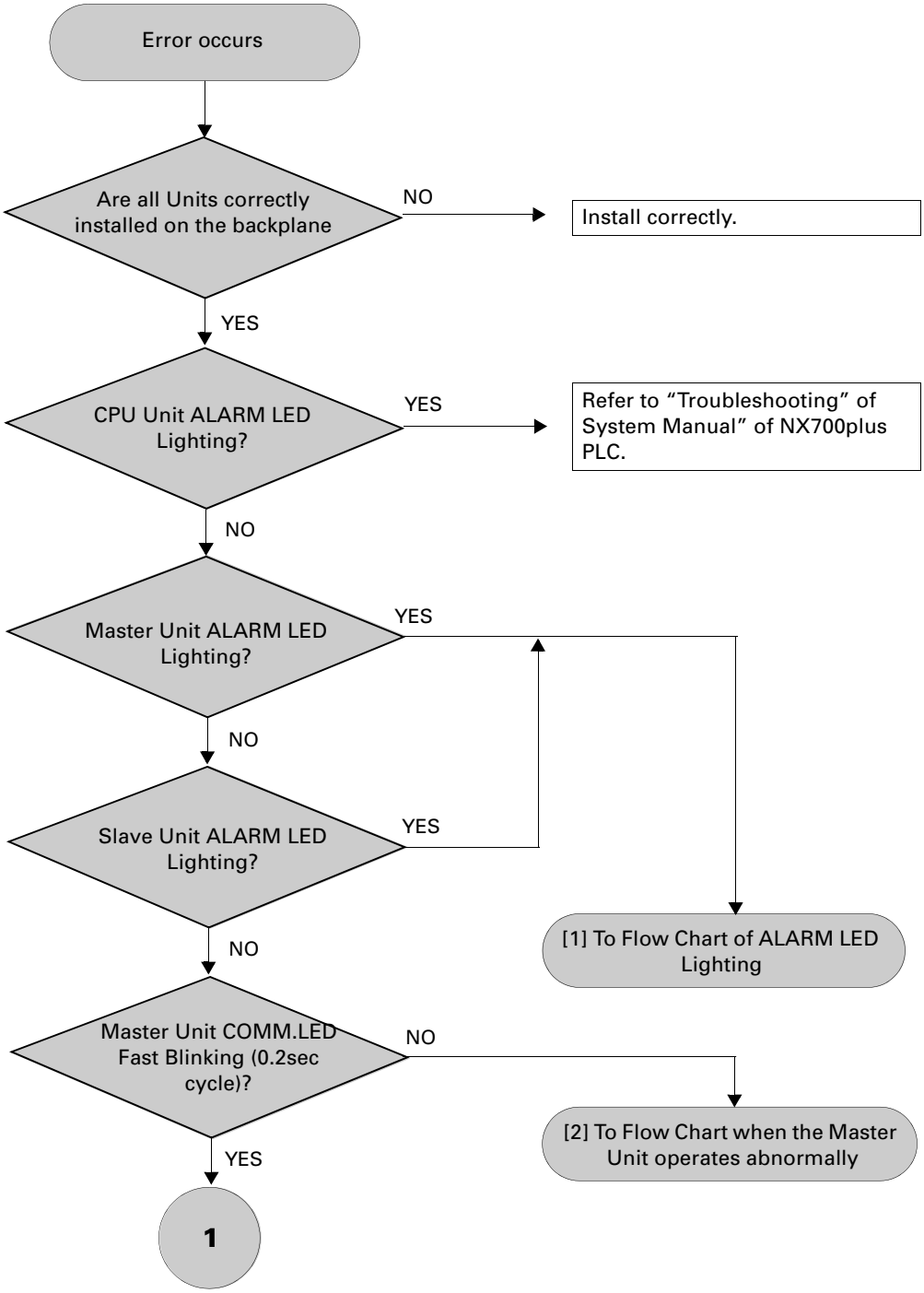
EXAMPLE If SR265=“0002H”, Slave Station No. 2 of Master 1(Loop1) is connected.
(“2H”= 00000000 00000010: bit 1 (No.2)=“1”)

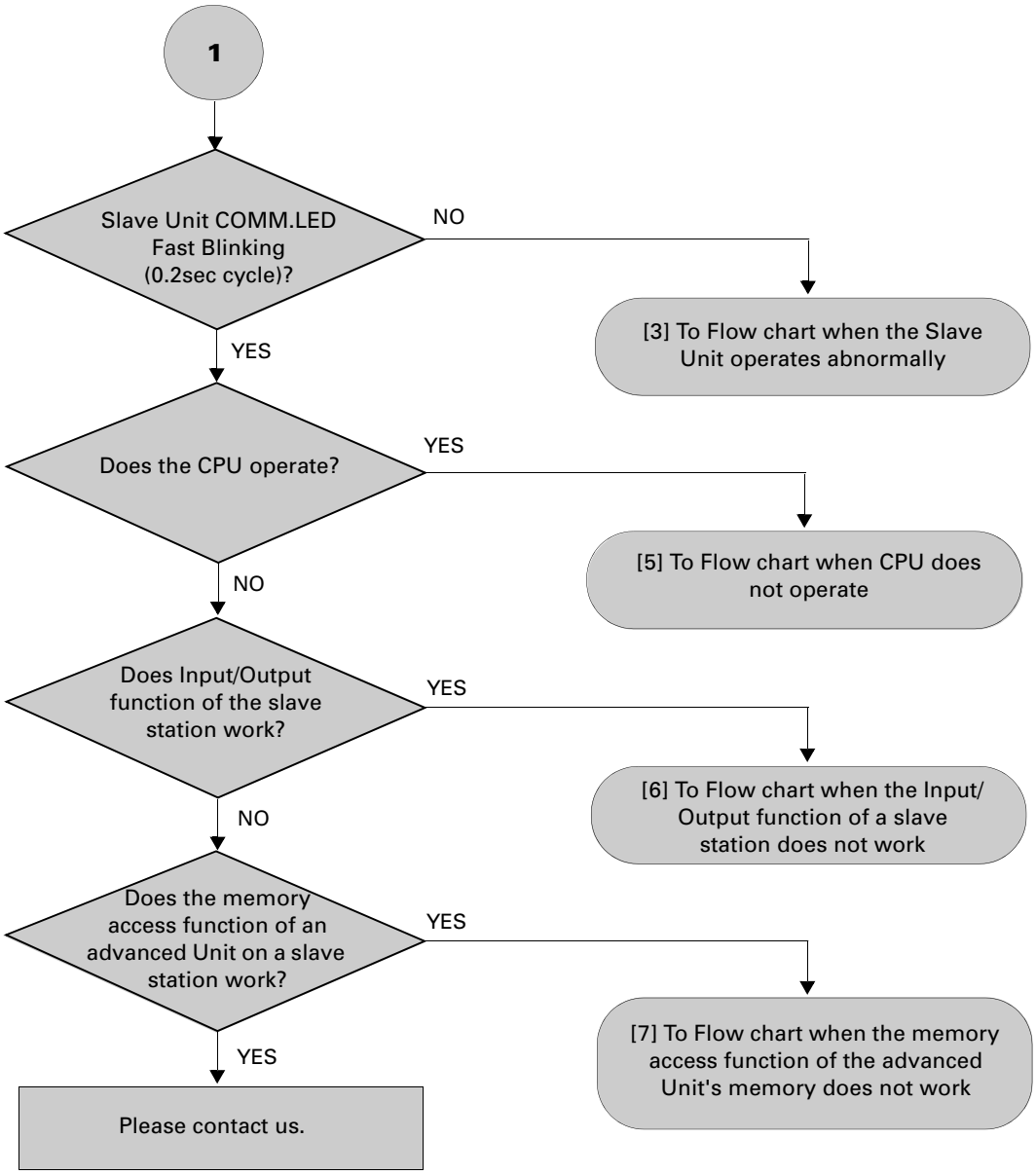
11

Troubleshooting

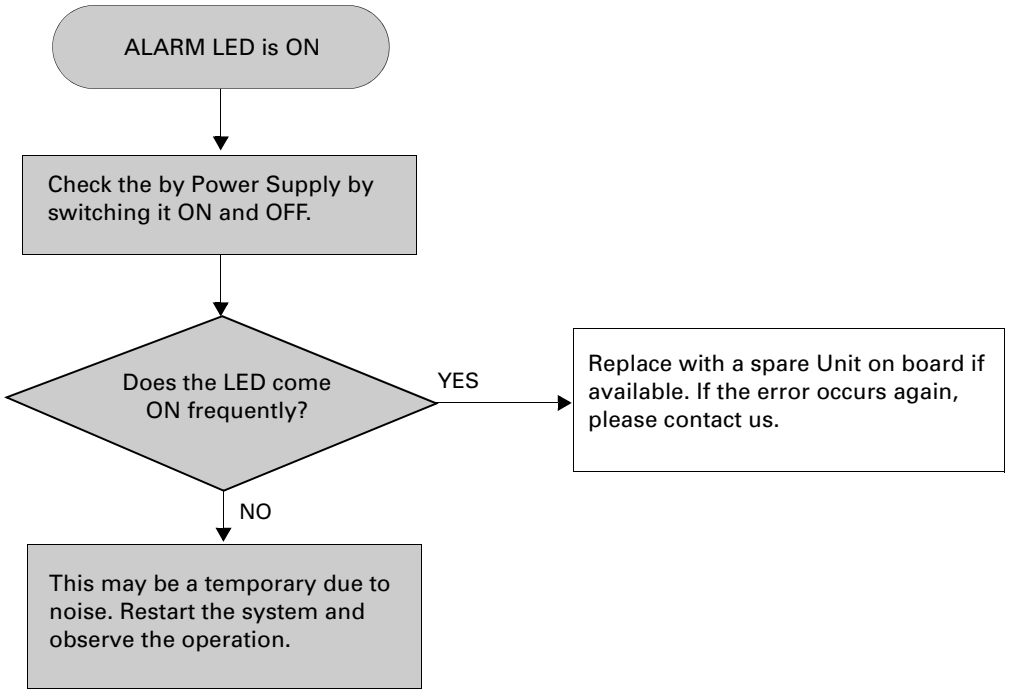
This section provides methods for troubleshooting the operation of the Remote I/O System.

Troubleshooting Flow Chart

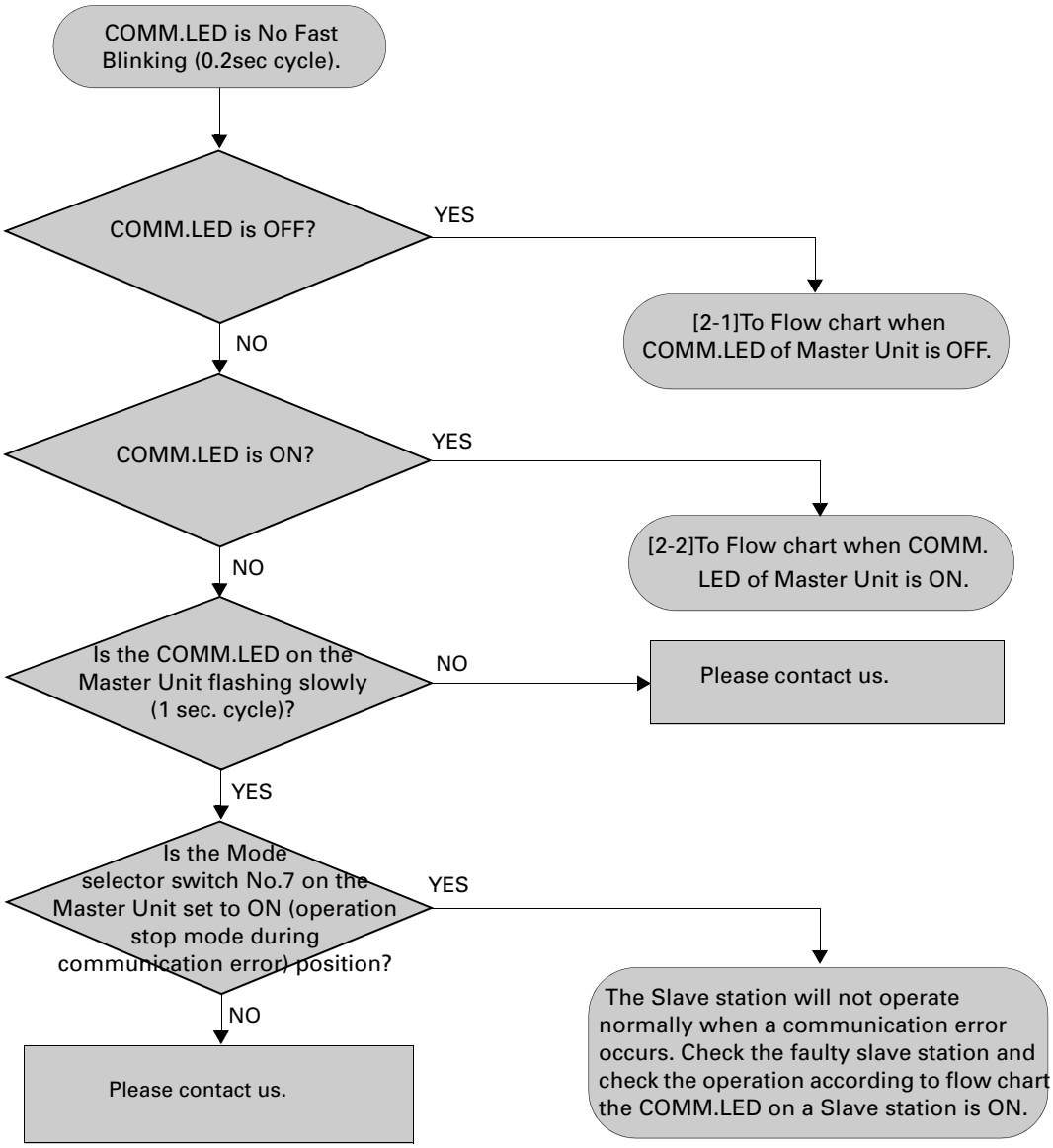



1
Slave Unit COMM.LED Fast Blinking (0.2sec cycle)?
NO
[3] To Flow chart when the Slave Unit operates abnormally
YES
Does the CPU operate?
YES
[5] To Flow chart when CPU does not operate
NO
Does Input/Output function of the slave station work?
YES
[6] To Flow chart when the Input/ Output function of a slave station does not work
NO
Does the memory access function of an advanced Unit on a slave station work?
YES
[7] To Flow chart when the memory access function of the advanced Unit's memory does not work
YES
Please contact us.

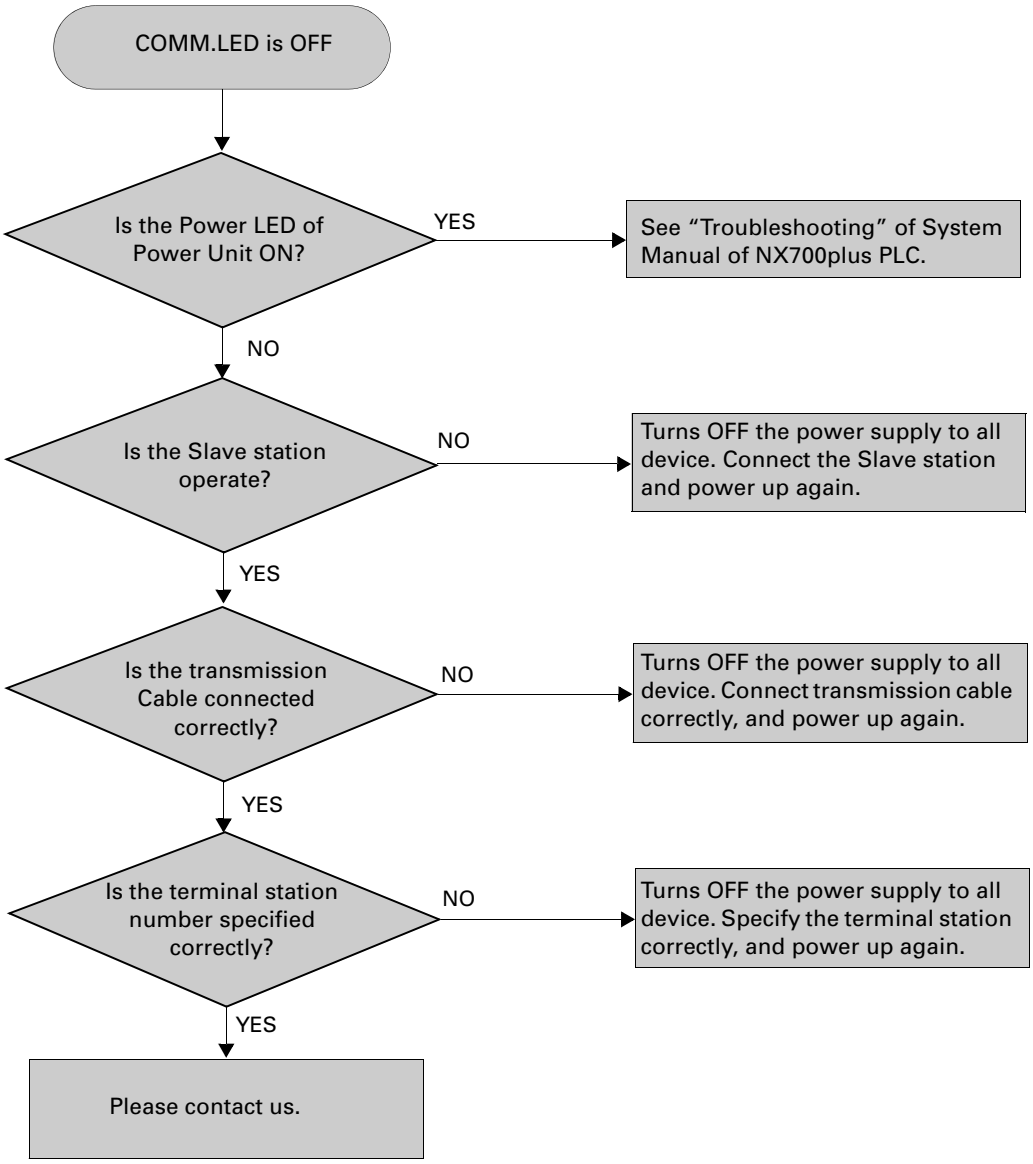
[1] Flow chart when ALARM LED is ON


ALARM LED is ON
Check the by Power Supply by switching it ON and OFF.
Does the LED come ON frequently?
YES
Replace with a spare Unit on board if available. If the error occurs again, please contact us.
NO
This may be a temporary due to noise. Restart the system and observe the operation.

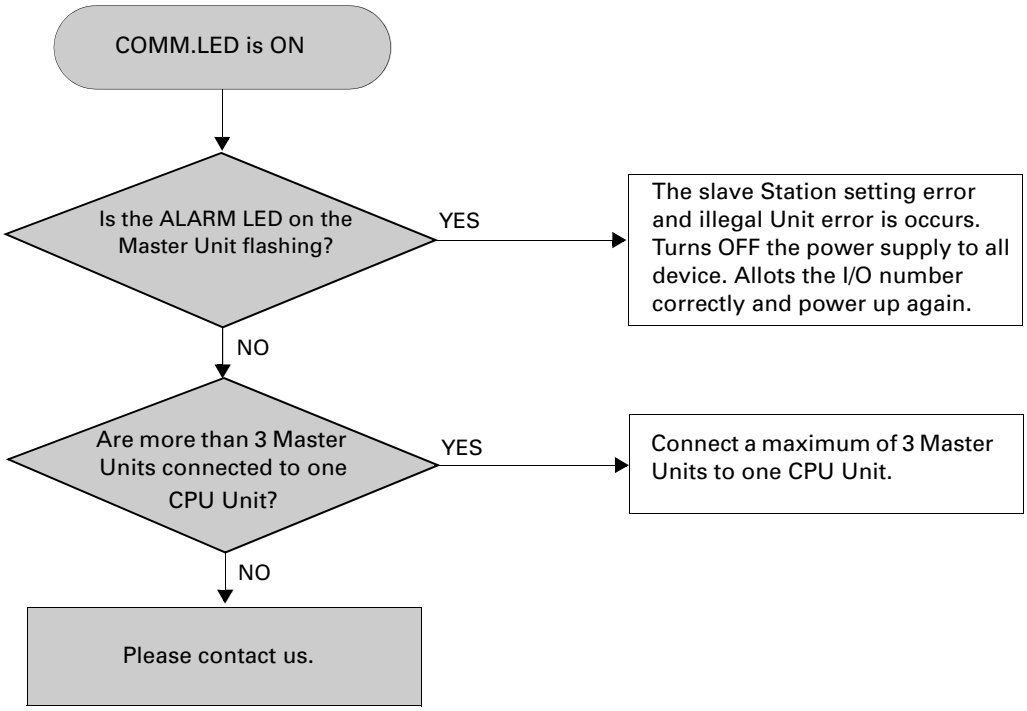
[2] Flow chart when the Master Unit operates abnormally


COMM.LED is No Fast Blinking (0.2sec cycle).
COMM.LED is OFF?
YES
[2-1]To Flow chart when COMM.LED of Master Unit is OFF.
NO
COMM.LED is ON?
YES
[2-2]To Flow chart when COMM. LED of Master Unit is ON.
NO
Is the COMM.LED on the Master Unit flashing slowly (1 sec. cycle)?
NO
Please contact us.
YES
Is the Mode selector switch No.7 on the Master Unit set to ON (operation stop mode during communication error) position?
YES
The Slave station will not operate normally when a communication error occurs. Check the faulty slave station and check the operation according to flow chart the COMM.LED on a Slave station is ON.
NO
Please contact us.

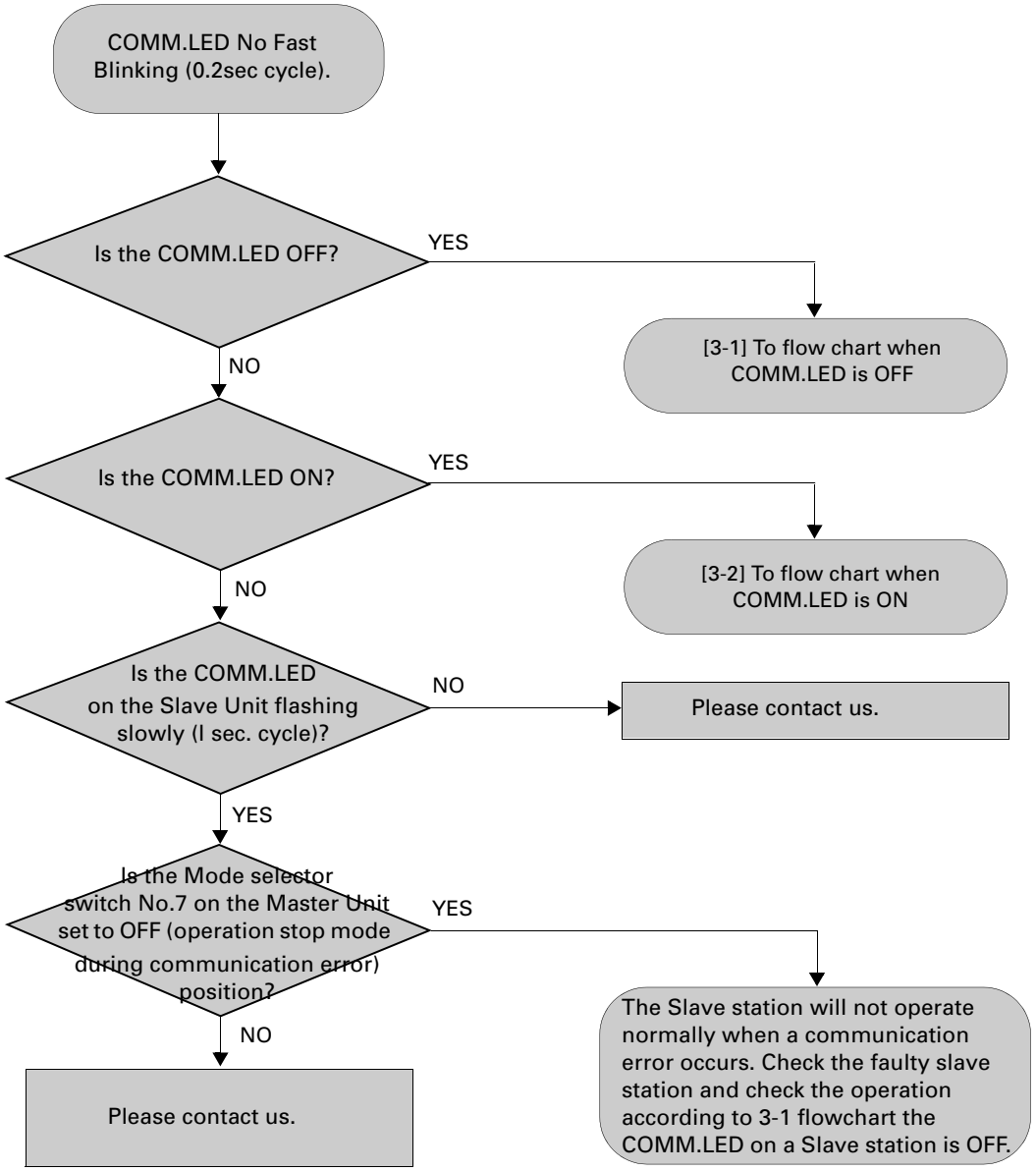
[2-1] Flow chart when COMM.LED is OFF.


COMM.LED is OFF
Is the Power LED of Power Unit ON?
YES
See "Troubleshooting" of System Manual of NX700plus PLC.
NO
Is the Slave station operate?
NO
Turns OFF the power supply to all device. Connect the Slave station and power up again.
YES
Is the transmission Cable connected correctly?
NO
Turns OFF the power supply to all device. Connect transmission cable correctly, and power up again.
YES
Is the terminal station number specified correctly?
NO
Turns OFF the power supply to all device. Specify the terminal station correctly, and power up again.
YES
Please contact us.

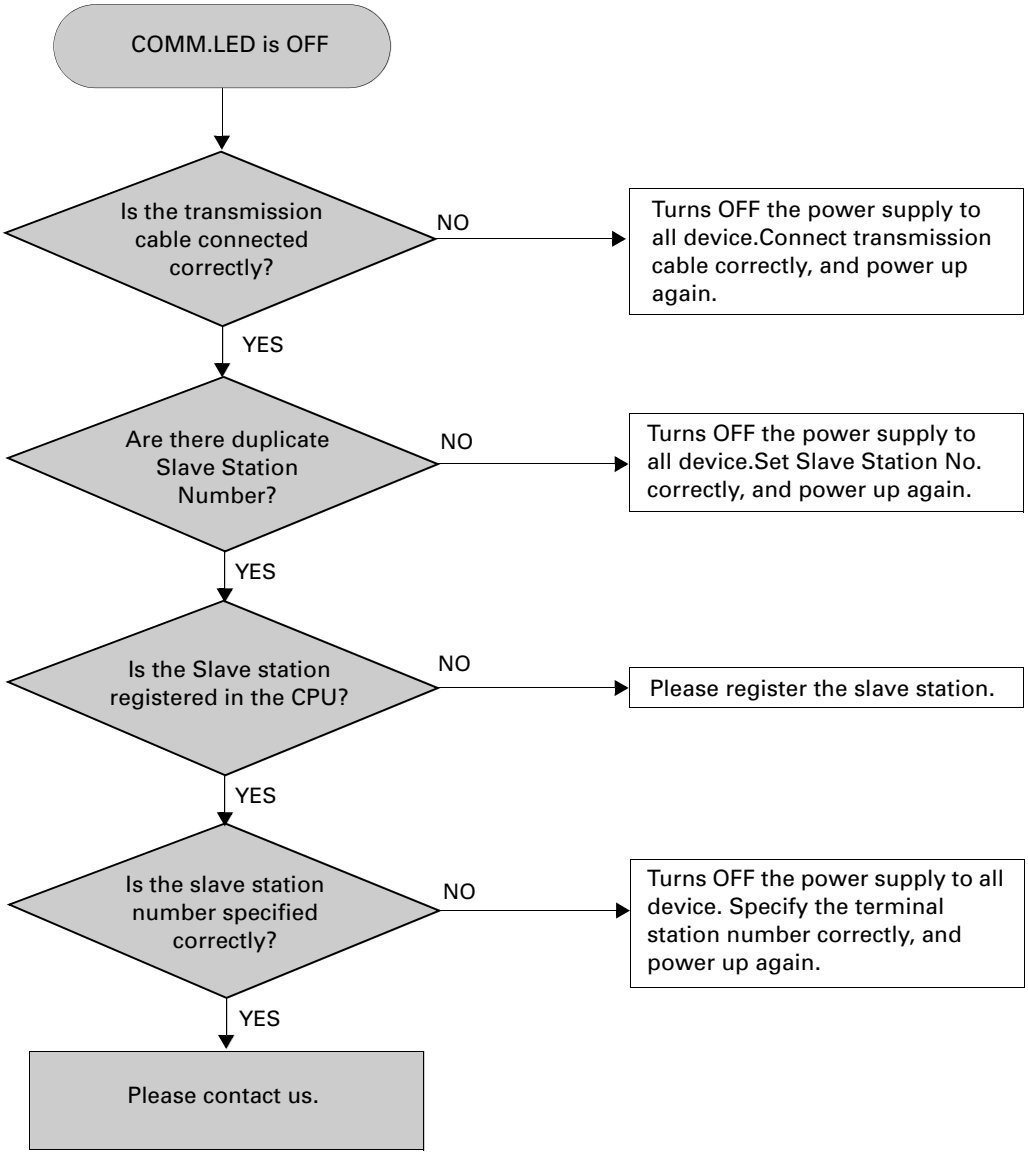
[2-2] Flow chart when COMM.LED is ON


COMM.LED is ON
Is the ALARM LED on the Master Unit flashing?
YES
The slave Station setting error and illegal Unit error is occurs. Turns OFF the power supply to all device. Allots the I/O number correctly and power up again.
NO
Are more than 3 Master Units connected to one CPU Unit?
YES
Connect a maximum of 3 Master Units to one CPU Unit.
NO
Please contact us.

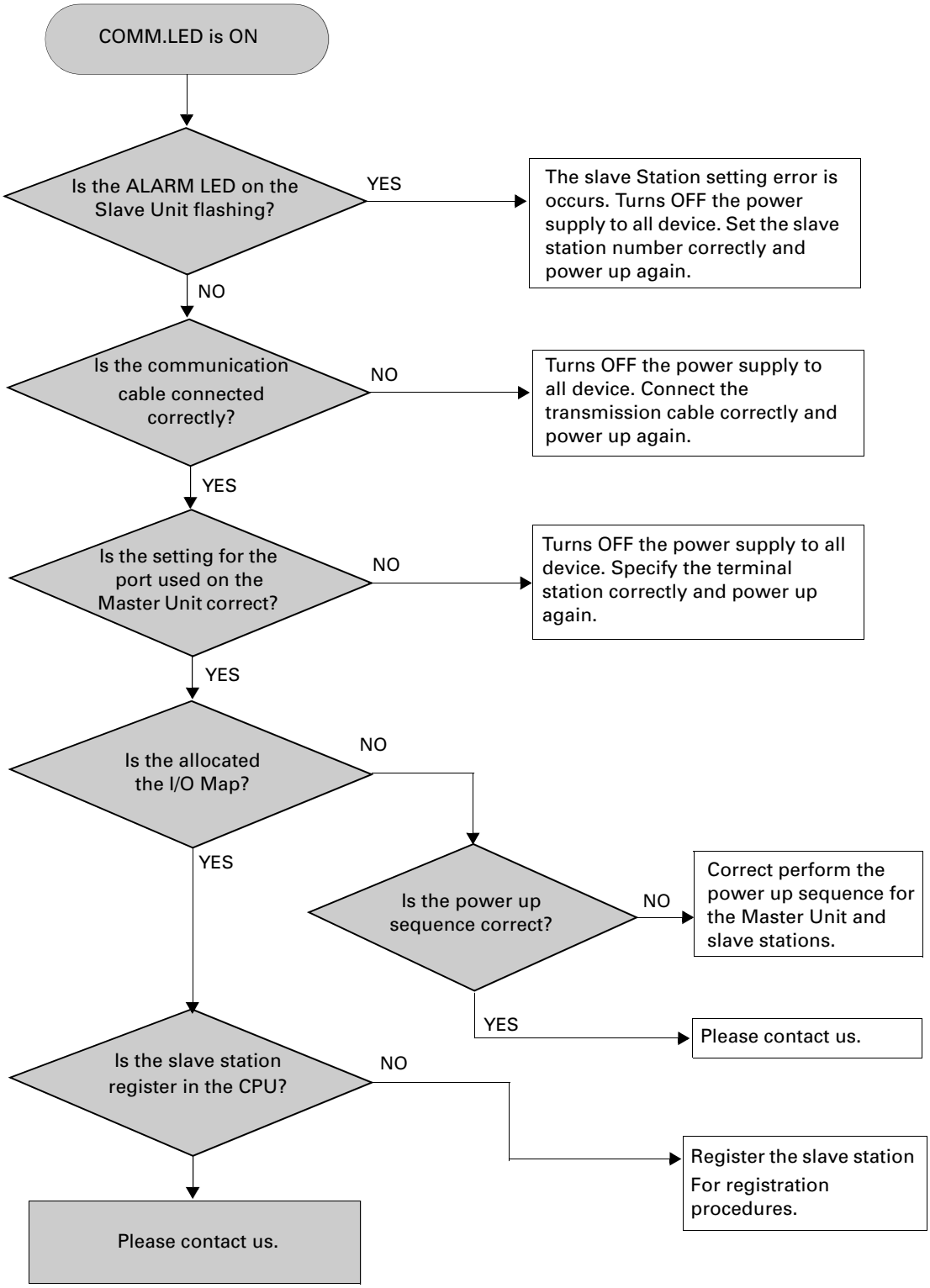
[3] Flow chart when the Slave Unit operates abnormally


COMM.LED No Fast Blinking (0.2sec cycle).
Is the COMM.LED OFF?
YES
[3-1] To flow chart when COMM.LED is OFF
NO
Is the COMM.LED ON?
YES
[3-2] To flow chart when COMM.LED is ON
NO
Is the COMM.LED on the Slave Unit flashing slowly (I sec. cycle)?
NO
Please contact us.
YES
Is the Mode selector switch No.7 on the Master Unit set to OFF (operation stop mode during communication error) position?
YES
The Slave station will not operate normally when a communication error occurs. Check the faulty slave station and check the operation according to 3-1 flowchart the COMM.LED on a Slave station is OFF.
NO
Please contact us.

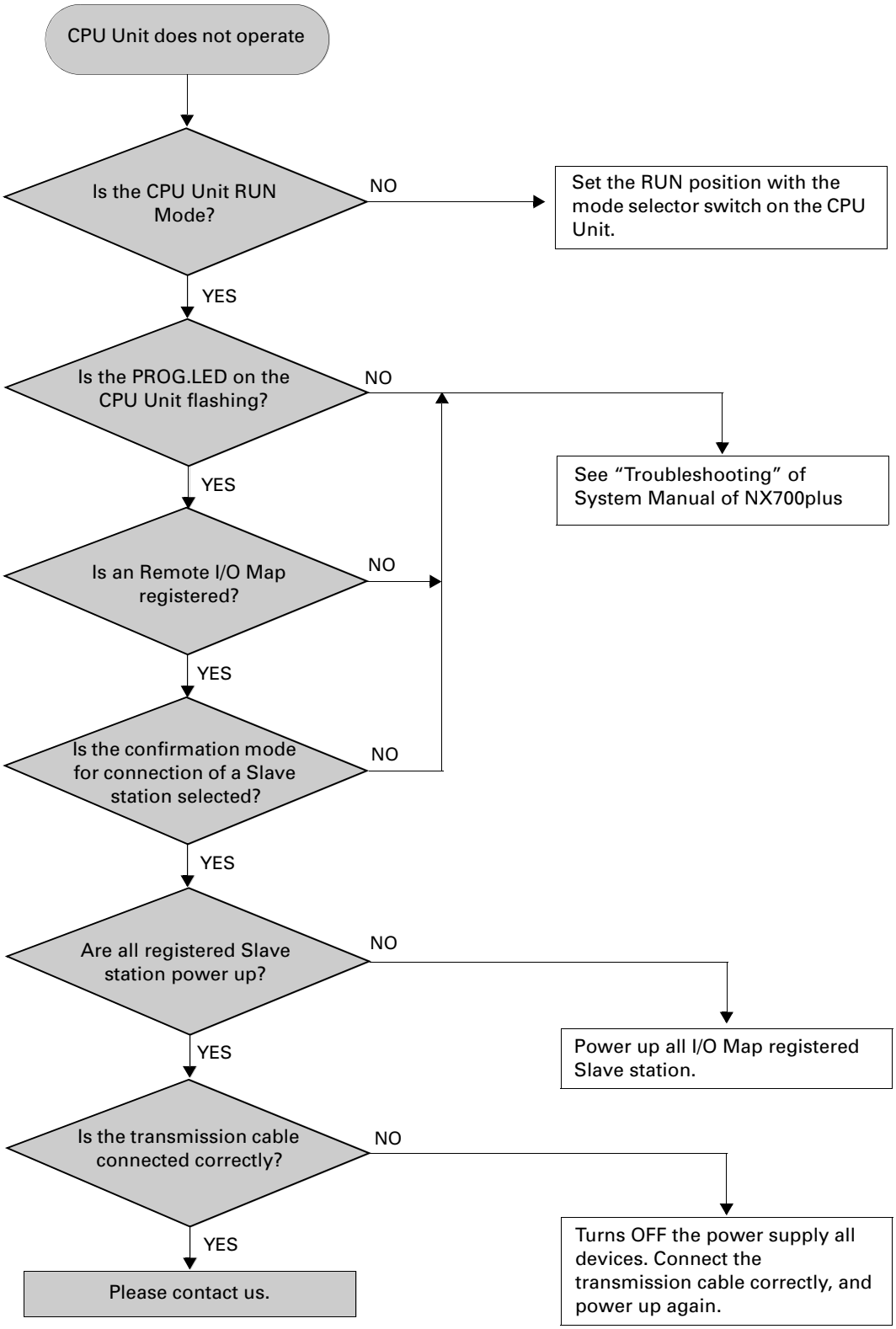
[3-1] Flow chart when COMM.LED is OFF


COMM.LED is OFF
Is the transmission cable connected correctly?
NO
Turns OFF the power supply to all device.Connect transmission cable correctly, and power up again.
YES
Are there duplicate Slave Station Number?
NO
Turns OFF the power supply to all device.Set Slave Station No. correctly, and power up again.
YES
Is the Slave station registered in the CPU?
NO
Please register the slave station.
YES
Is the slave station number specified correctly?
NO
Turns OFF the power supply to all device. Specify the terminal station number correctly, and power up again.
YES
Please contact us.

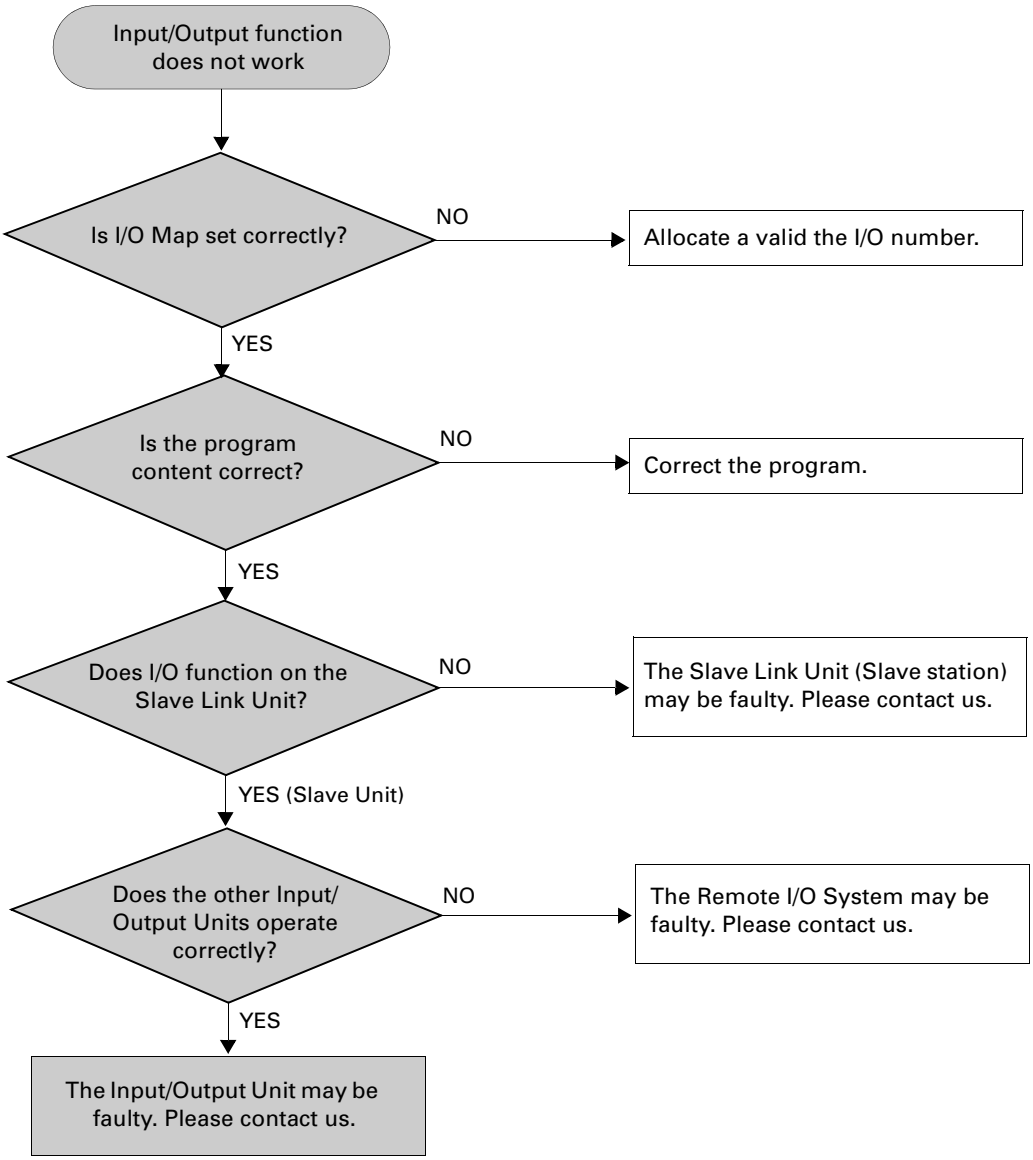
[3-2] Flow chart when COMM.LED is ON


COMM.LED is ON
Is the ALARM LED on the Slave Unit flashing?
YES
The slave Station setting error is occurs. Turns OFF the power supply to all device. Set the slave station number correctly and power up again.
NO
Is the communication cable connected correctly?
NO
Turns OFF the power supply to all device. Connect the transmission cable correctly and power up again.
YES
Is the setting for the port used on the Master Unit correct?
NO
Turns OFF the power supply to all device. Specify the terminal station correctly and power up again.
YES
Is the allocated the I/O Map?
NO
YES
Is the power up sequence correct?
NO
Correct perform the power up sequence for the Master Unit and slave stations.
YES
Please contact us.
Is the slave station register in the CPU?
NO
Register the slave station
For registration procedures.
Please contact us.

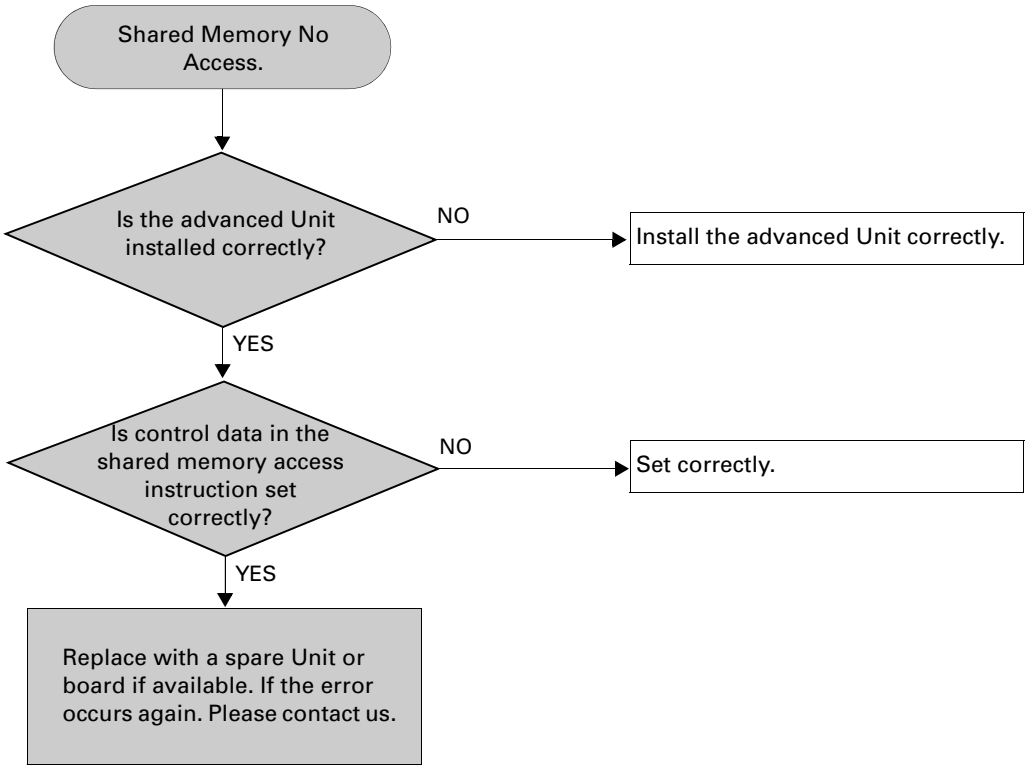
[4] Flowchart when CPU Unit does not run


CPU Unit does not operate
Is the CPU Unit RUN Mode?
NO
Set the RUN position with the mode selector switch on the CPU Unit.
YES
Is the PROG.LED on the CPU Unit flashing?
NO
See “Troubleshooting” of System Manual of NX700plus
YES
Is an Remote I/O Map registered?
NO
YES
Is the confirmation mode for connection of a Slave station selected?
NO
YES
Are all registered Slave station power up?
NO
Power up all I/O Map registered Slave station.
YES
Is the transmission cable connected correctly?
NO
Turns OFF the power supply all devices. Connect the transmission cable correctly, and power up again.
YES
Please contact us.

[5] Flow chart when the Input/Output function of a slave station does not work


Input/Output function does not work
Is I/O Map set correctly?
NO
Allocate a valid the I/O number.
YES
Is the program content correct?
NO
Correct the program.
YES
Does I/O function on the Slave Link Unit?
NO
The Slave Link Unit (Slave station) may be faulty. Please contact us.
YES (Slave Unit)
Does the other Input/ Output Units operate correctly?
NO
The Remote I/O System may be faulty. Please contact us.
YES
The Input/Output Unit may be faulty. Please contact us.

[6] Flow chart when the memory access function of the advanced Unit's memory does not work


Shared Memory No Access.
Is the advanced Unit installed correctly?
NO
Install the advanced Unit correctly.
YES
Is control data in the shared memory access instruction set correctly?
NO
Set correctly.
YES
Replace with a spare Unit or board if available. If the error occurs again. Please contact us.

Checking of LED Lighting Condition

Check the CPU Unit, Master Unit, Slave Unit, Slave link Unit for ON/OFF status of their LEDs, then find the cause of the error by referring to the table below.

LED status when the system is turned ON

CPU Unit	Master Unit	Slave Unit	Display	Countermeasures
¤ PROG. (ON)	✦ COMM. (Fast blinking)	✦ COMM. (Fast blinking)	Normal	
✦ PROG. (Blinking)	✦ COMM. (Fast blinking)	✦ COMM. (Fast blinking)	There is slave station which is not activated although its I/O numbers are registered in the CPU. ("Slave station connection wait mode" is activated. Even if the CPU goes to the RUN mode, the operation will not start.)	Turn ON the power go the slave stations which is not activated. Check the transmission cable to see if it is connected correctly. Make sure all the slave stations registered in the CPU are connected Match all of the settings, then restart again.
¤ ERROR (ON)	ALARM (ON)		Temporary error caused by noise	Restart the system.
			Error on the Master Unit.	Please contact us.
	● ALARM (OFF))	¤ ALARM (ON)	Temporary error caused by noise	Restart the system.
			Error on the Slave station.	Please contact us.
	COMM. (ON)		More than 3 Master Units are installed.	Install up to 3, Restart the system.
	X	✦ COMM. (Fast blinking) ALARM (Blinking)	There are Unit which cannot be installed on a slave station where a Slave Unit is installed.	Check the advanced Units which can be installed on a slave station together with a Slave Unit. Reconfigure the slave station. Remove any Unit which cannot be installed on the station.
		✦ COMM. (Fast blinking)	Terminal stations are not assigned correctly.	Both ends of transmission cable for correct connection. Check the ports of the Master Unit.

CPU Unit	Master Unit	Slave Unit	Display Content	Countermeasures
¤ ERROR (ON)	X	○ COMM. (ON)	Transmission Cable is not connected correctly.	Check the transmission cable for correct connection. Check the ports of the Master Unit.
			Slave stations is not registered.	Register the slave station, and then restart the system.
		● COMM. (OFF)	Transmission Cable is not connected correctly.	Turn ON the power of the slave stations which is not activated.
			The Slave stations number is duplicated	Make sure the transmission cable is connected correctly. Make sure all the slave stations registered in the CPU are connected.
			The terminal stations are not assigned correctly	Connect the settings, then restart.
		¤ COMM. (ON) ALARM (Blinking)	The Slave stations number is out range (1 thru 32)	Assign a slave station number within the applicable range (1 thru 32)

LEDs Status during the operation

CPU Unit	Master Unit	Slave Unit	Display Content	Countermeasures
¤ RUN (ON)	✣ COMM. (Fast blinking)	✣ COMM. (Fast blinking)	Normal	
¤ ERROR (ON)	✣ COMM. (Fast blinking)	✣ COMM. (Fast blinking)	Error on a slave station Unit where a slave Slave Unit is also installed.	Exchanged bad Unit with good one, then restart the system
			Termination station are not set correctly.	Both ends of transmission path must be terminal stations.
¤ ERROR (ON)	✣ COMM. (Fast blinking)	● COMM. (OFF)	This Slave station cannot be communicate with the Master station. (Communication Error)	Check the transmission cable for correct connections, then restart the system.
	✣ COMM. (Slow blinking)	✣ COMM. (Slow blinking)	Other Slave stations have a transmission error. (A slave station whose communication LED is flashing is normal)	Check the transmission cable for correct connections, then restart the system.
	✣ COMM. (Slow blinking)	● COMM. (OFF)	This Slave station whose communication LED is OFF has a communication LED is flashing is normal)	Check the transmission cable for correct connections, then restart the system.

NX700/NX70 Remote I/O System User Manual

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